

TEACHER TEXT

**Higher Secondary Course**

COMPUTER SCIENCE

CLASS - XII

HTML

C++

JavaScript

CyberLaw

DBMS

PHP



Government of Kerala  
DEPARTMENT OF EDUCATION

State Council of Educational Research and Training (SCERT), Kerala

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## **FOREWORD**

Dear teachers,

The **Teacher Text for Class XII Computer Science** is intended to serve as a transactional aid to facilitate classroom transaction and as a ready reference for teachers. The textbook on Computer Science is developed as per the approaches and methods suggested by the ***Kerala School Curriculum 2013***. As the curriculum is activity-based, process-oriented and rooted in constructivism, focusing on the realization of learning outcomes, it demands higher level proficiency and dedication from the part of the teachers for effective transaction.

The Teacher Text offers some guidelines for the transaction of the concepts highlighted in the Textbook. It helps a teacher to engage in the teaching-learning process by providing sample transactional strategies. Those strategies are only suggestive and not prescriptive. Teachers can refer to them and apply their skill and creativity to design and implement effective strategies depending on the level of learners. It is to be ensured that the learners achieve significant learning outcomes at each level, as envisaged in the curriculum. The Teacher Text also contains an exclusive section for the guidelines to the lab work and practical examination.

The Textbook and Teacher Text on Computer Science are prepared by a team of practising teachers under the guidance of a panel of subject experts. All possible efforts have been taken to make the books learner-friendly and interesting. There is no denying the fact that our teachers are resourceful and committed, and hence directions towards the right path can make the transaction of the curriculum most effective and productive.

Creative criticism and suggestions for improvement of the book are most welcome.

**Dr. S.Raveendran Nair**

Director  
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## **About Teacher Text...**

The teacher text is a resource to teachers that helps daily planning, provides instructions adequate to carry out the activities in the textbook, persuades the teacher to seek for more information and provides the additional information needed for the teacher. The relevance of the teacher text is that the teacher must be provided with deeper insight of the activities in the textbook, additional activities, evaluation models and communication techniques. Hence the following are included in the teacher text.

Teacher text is organised in two parts. Part I narrates the approach of higher secondary curriculum revised in accordance with the Kerala School Curriculum 2013. This part consists of the General Approach, Assessment Approach, Subject Approach, Syllabus, Learning Outcomes and Scheme of Work of the subject. Part II is composed of the unit analysis of all chapters in the text book. Unit analysis of a chapter gives the comprehensive vision about the chapter. Part III includes guidelines for lab work, and practical evaluation with a pool of question. This section also contains two sample question papers for Term-end Evaluation. Unit analysis of a chapter consists of the following:

### **Introduction**

An introduction is provided for each unit. The main concepts aimed in the lesson, process skills to be developed among students, the values and attitudes to be inculcated and the social significance of the topic are indicated in the introduction. It is a window to each lesson.

### **Unit Frame**

Each unit frame is a precise and comprehensive presentation of concepts dealt with in the chapter and the transactional strategies to attain the learning outcomes. A unit frame has 3 columns. The first column includes details regarding the concepts the learner should know, the process skills to be developed etc. for achieving the results of study. The second column indicates the teaching-learning

activities. The last column includes the learning outcomes that the student must achieve. The approximate time needed for each unit is mentioned. Teachers have the freedom to design and plan suitable strategies for the transaction of the concepts. But care should be given to ensure that the activities are learner centered, process oriented, constructivist and able to attain process skills and learning outcomes.

### **Towards the Unit**

This section details the activities specified in the unit frame. The involvement of teacher and learners are mentioned in the description of the activities. The activities detailed are only suggestions. According to the competency level of the learners and the facilities in the school, teacher can frame suitable transactional strategies. Extended activities may be given to promote the scholars to achieve higher level process skills and conceptual depth.

### **Assessment**

It needs no emphasis to state the importance of evaluation for effectively conducting learning activities. Assessment indicators of important activities and products that ought to be subjected to evaluation in each module are provided in the teacher text. This does not mean that they are only to be evaluated. The teacher has to prepare his/her own worksheets for continuous evaluation, self-evaluatory devices and mutual evaluatory devices. Some models are given in the teacher text.

At the end of each unit, a set of sample questions and scoring indicators are given to prepare for term-end evaluation.

# Part I

## General Approach

### Introduction

The National Curriculum Framework 2005 sowed the seeds for many reforms in the field of education in India. Subsequently, NCERT prepared textbooks for various subjects based on NCF 2005. Later the, Kerala Curriculum Framework 2007 was formed and the curriculum upto high school level was revised. The Right to Education Act of 2009, Prof. P.O.J.Labba Committee Report related to Higher Secondary Education and Dr. P.K.Abdul Aziz Committee Report related to a comprehensive curriculum revision - all pointed towards the necessity of curriculum reform.

In the 1990s, a new curriculum with comprehensive changes in learning and pedagogy was introduced at the primary level. Based on this activity-based, process-oriented and learner-centred curriculum, Continuous and Comprehensive Evaluation (CCE) and grading system were implemented. Subsequently, this method was introduced at the Higher Secondary level too.

### Significance of Curriculum Revision

Though activity-based pedagogy has already been introduced at the higher secondary level, a comprehensive revision of curriculum has not been implemented yet. The ongoing syllabus revision interacts with contemporary events and takes into consideration the nature of

*The curriculum, syllabus and textbooks being followed for more than five years should be revised and reformed urgently by SCERT.*

***Prof.P.O.J.Labba Committee***

*As a knowledge society, it is of paramount importance to basically restructure and reform the curriculum to face the challenges posed by the times.*

***Dr. P.K.Abdul Aziz Committee***

the learner. As a stepping stone to the higher education sector, the higher secondary curriculum should be raised to international standards. International standards do not refer to the standard of education set by any particular country. On the other hand, it must inculcate in the learner the ability to take his life forward wherever he is, after the completion of his higher secondary education. It is the sum-total of all the experiences and knowledge to be picked up by the learner for meeting the needs. This emphasizes the need to provide internationally accepted teaching-learning models to our students. The curriculum revision has been envisaged as an attempt in that direction.

**RIGHT TO EDUCATION ACT - 2009**

**Section - 29 (Chapter 5)**

**Curriculum and evaluation procedure**

- (1) The curriculum and the evaluation procedure for elementary education shall be laid down by an academic authority to be specified by the appropriate Government, by notification.
- (2) The academic authority, while laying down the curriculum and the evaluation procedure under sub-section (1), shall take into consideration the following, namely:
  - (a) conformity with the values enshrined in the Constitution;
  - (b) all round development of the child;
  - (c) building up child's knowledge, potentiality and talent;
  - (d) development of physical and mental abilities to the fullest extent;
  - (e) learning through activities, discovery and exploration in a child-friendly and child-centred manner;
  - (f) medium of instruction shall, as far as practicable, be in child's mother tongue;
  - (g) making the child free of fear, trauma and anxiety and helping the child to express views freely;
  - (h) comprehensive and continuous evaluation of child's understanding of knowledge and his or her ability to apply the same.

The curriculum should be revised ensuring the above-mentioned factors, and the revision of the curriculum has to be viewed against this backdrop.



## **Kerala School Curriculum (2013) - Chief characteristics**

### **The curriculum**

- is learner-centred, process-oriented, activity- based and value oriented.
- gives stress to the learning outcomes that a learner imbibes at the cognitive, social and emotional levels.
- lays stress on the skills to be attained by the learner in values and attitude.
- is based on the philosophy of constructivism.
- gives teachers freedom to choose and employ logical and varied learning strategies for the transaction of curriculum.
- is flexible to implement various teaching - learning strategies recognizing the learning outcomes, nature of the content and the different levels of the learners. Discovery learning, Concept attainment model, Inductive method, Meta cognition, Co-operative learning, Collaborative learning, Reflective learning, and giving opportunities to individuals and group learning etc. are taken into consideration.
- is comprehensive and takes into consideration the various stages from the pre-primary level to the higher secondary level.
- designs innovative learning strategies as well as assessment activities for children with special educational needs.
- ensures a Continuous and Comprehensive Evaluation (CCE) focused on learning outcomes.
- stresses Health and Physical Education, Art Education and Work Education.
- lays stress on Right-based Education in the light of Right to Education Act, 2009.
- provides an opportunity to the learner to experience necessary safety, care and security both at school and in the classroom by raising the teacher to the level of a mentor.
- lays stress on the Code of Professional Ethics for school teachers.
- helps to acquire new learning skills which enable the learner to face contemporary challenges.

- is intended to inculcate human values in the learners.
- ensures equity and equality among the learners.
- ensures the harmony of head, heart and hand and aims at a comprehensive development envisioned to make learning natural.

### **Curriculum Approach**

Our curriculum has been developed, imbibing new thoughts in educational psychology and philosophy. The idea of constructivism put forth by NCF 2005 is the basis for the Kerala School Curriculum 2013 too. In constructivism, learning is the process of the construction of knowledge.

The striking features of the curriculum transaction approach are:

- i. Activity - based
- ii. Process- related
- iii. Ensure learning
- iv. Focus to attain learning outcomes
- v. Environment- friendly
- vi. Highlights development areas
- vii. Suitable for the nature of the learner
- viii. Integrates learning and assessment

A learning process based on constructivism is the foundation of the curriculum. A distinguishing feature of this approach is that knowledge is constructed naturally by creating challenging learning activities and considering the acquired knowledge and conceptual background of the learner.

### **Learning Experiences**

The acquired knowledge skills and interests differ from learners coming from different backgrounds. So it is very important to facilitate learning experiences imbibing these changes and considering individual differences and multiple intelligences of the learners.

## Learning Environment

The classroom should be designed to keeping in mind the interest and development of the learner so as to ensure his/her participation in various learning activities. Every activity should be learner-oriented. A conducive environment should be created. The freedom to employ suitable learning strategies which are learner-centred and activity-based, taking into consideration the development and growth in the learning ambience rests with the teacher.

## Learning Process

- Each learner constructs knowledge by linking it with his/her previous experiences.
- Knowledge construction occurs at the level of the individual through meaningful societal interventions.
- Learning is made effective through multi-sensory experiences which consider various learning styles, learning pace etc.
- Learning becomes more effective through co-operative learning in an environment conducive for co-operation.
- Learning materials should be meaningful generating interest in the learner.
- Spiralling of learning experiences will make learning more effective.
- By ensuring flexibility of learning activities and possibilities of adaptation, learners requiring special educational needs and with different aptitudes may be attended to.
- Each learner should get learning experiences necessary to ensure learning outcomes.
- Learning and Assessment should be complementary.
- Everybody can attain learning outcomes by adopting suitable teaching- learning strategies that consider content and learning requirements of the learner.
- The learning process should be decided keeping in view the comprehensive development of each learner.

## **Learning Outcomes**

As per the rules of the RTE Act, the idea of learning outcomes was introduced in the Kerala School Curriculum 2013. Knowledge of learning outcomes is essential to plan the teaching-learning process and evaluation, in a precise and practical manner. Learning outcomes are the aims to be achieved by the learner during the various stages of school education. Precise and accurate statements based on the knowledge, skills, attitudes, values etc. to be acquired by a learner in a particular subject-area are called Learning Outcomes.

The learning outcomes should be stated based on performance that can be observed and measured. An analysis of the learning outcomes will help assess the knowledge, skills, values and attitudes that should be acquired by the learner at the end of each unit, class and stage have been acquired or not. Precise and clear assessment activities can be planned, based on specific learning outcomes.

## **Information and Communication Technology**

Today information and communication technology has an important role in the construction and dissemination of knowledge. This is made possible through gathering of information, analysis and varied presentations. The immense possibilities of ICT can be used to transact any subject at the higher secondary level. Through this, it can also be ensured that learners acquire ICT skills. The main features of ICT are stated below.

## **Art Education**

Arts evolved as a part of providing enjoyable experiences in the progress of man as a social animal.

The experiences gathered during various phases of life touch human minds aesthetically. All the art forms that evolved from ancient times were visual and auditory. It had the power of rejuvenating the human mind. This is the unique characteristic of art.

Art education at the higher secondary level aims to develop the creative skills acquired by the learner and to create in him a broader outlook about art and literature. Also an aptitude for higher studies

and research in the field of arts has to be developed in them. In order to develop observation skill, ability to appreciate and sense of imitation among learners, art education is essential. It also helps learners to develop abilities to think and respond differently, to ensure social intervention and to make learning more productive. Activities in art help to make children work hard and diligently, and also channelize their enthusiasm in the right direction.

### **Health - Physical Education**

The term health refers to the complete state of physical, mental, emotional and spiritual well-being. Therefore health is essential for the existence of an individual. So proper implementation of health and physical education is essential. The minimum physical fitness required for every individual in the society in order to exist should be ensured. For this, health and physical education should be imparted scientifically and comprehensively from a very early age. The views of National Curriculum Framework 2005 regarding need based and integrated approach should be given special attention and emphasis.

Along with the knowledge of content areas, performance excellence and physical fitness are also to be assessed. The health-physical education envisioned in Kerala School Curriculum 2013 and initiated at the primary level, gets perfected at the higher secondary level only. Learning activities should be planned so as to enable learners excel in this field to explore up to the level of international possibilities. The physical fitness, training excellence and knowledge of content areas acquired hitherto promote holistic well-being.

### ***Objectives of Health - Physical Education***

- To get an awareness about sports, values and ethics.
- To gain expertise in athletic skills and to scientifically analyse them.
- To gain expertise in major games.
- To get practical training in self defence techniques.
- To understand aggression, balanced or controlled aggression etc.
- To realise the consequences of the use of drugs.

- To create the right understanding about sexual health.
- To acquire scientific practical ability to intervene effectively during life rescue missions.
- To get an awareness about the changes in the respiratory and cardio-vascular system that can be brought through exercise.
- To give training using safe and effective exercise pattern.

### **Work Education**

The confluence of knowledge acquired through hearing, sight and work makes construction of knowledge possible in a learner. Contemporary learning process evolves through enquiry and experiences. Work education is essential to integrate and develop emotional and cognitive domains.

A work education integrated with the subjects of higher secondary curriculum, will be more appropriate.

### ***Objectives of Work Education***

- Readiness to work
- Development of values and attitudes
- Development of a balanced personality
- Self-sufficiency in the field of production
- Human skill development
- National development

### **Inclusive Education**

In the classroom, an atmosphere that is congenial to all learners without excluding any one must be created. In our schools there are two categories of students, one who requires more consideration, help and attention and the other who requires normal help and attention. Only by addressing this can we ensure equitable quality education.

### **Areas which help to develop values, attitudes and commitments**

Areas such as awareness of humanitarian and constitutional values, attitudes that strengthen social life and growing social commitment are the prime concerns of the curriculum. Details of the conceptual areas are given below.

**Democratic Outlook**

While choosing the content for different subjects, the perspectives on democracy have to be considered. In the planning and transaction of learning activities, there should be a democratic approach. The aim of the curriculum is to establish a democratic approach through democratic platforms.

**Constitutional Values**

The values and objectives that are upheld by our Constitution have to be reflected in the curriculum. The content and the transaction process should be selected to enable learners acquire constitutional values.

**Secular Attitude**

Subject areas which help in developing a secular attitude have to be included.

**Tolerance**

The curriculum should aim at developing the quality of tolerance towards those who disagree with you.

**Constructive and Creative Thinking**

There is a need to develop creative thinking and the urge for discovery among learners. There should be possibilities for creative enquiry in the content areas and learning strategies of the curriculum. The different levels of multiple intelligences should also be considered.

**Respect for one's cultural heritage**

Respectful attitude to one's cultural heritage and history is one of the aims envisioned by the curriculum.

**Equality**

It is essential to ensure equality in learning activities, which are provided to the learners.

**Leadership Quality**

There is need to design learning strategies that would help in shaping leaders who are capable of facing the challenges of this millennium. In the classroom, opportunities must be created to develop leadership qualities among children.

### **Life Skill Education**

Life skills such as self awareness, empathy, communication skill, interpersonal relationship, creative thinking, critical thinking, decision-making, problem-solving, coping with emotions and coping with stress should be developed in learners. These life skills help the learner to face life with self-confidence.

### **Civic Sense**

Just as the state has certain duties to the citizens, the citizens also have some duties to the state. The aim of education is to create a community with civic sense and a sense of responsibility and discipline.

### **Respect for Elders**

Respect for elders is the keystone of our civilization. In all cultures, old people are venerated and given due consideration. An important characteristic of the elder people is that they are a store house of experiences. Our cultural life being continuous and heritage-oriented, the age-old experiences and knowledge are handed down from one generation to another. Factors which encourage learners to express respect for elders through co-operative interventions should be made part of the transaction of content.

### **Human Rights**

Human rights are the rights of individuals to lead a life of dignity. The human rights which got universal acceptance through the United Nations Declaration of Human Rights should be given importance in the curriculum.

### **Child Rights**

It is our duty to protect every right of the child.

### **Awareness about Environment**

Basic awareness about nature and the need to protect natural resources should be included from the primary level itself. Children should be made to understand that environmental hygiene is as important as personal hygiene and that sense of hygiene is one of the basic factors of civic sense. They should understand that nature and natural resources are not meant just for the consumption of



human beings and that any change in the balance of nature will have far-reaching consequences. They should carry out activities which make protection of natural resources and environmental hygiene a value-system and an attitude.

### **Water Literacy**

Children must be made to understand that water is precious by creating awareness about the availability of water, conservation of water and the need to keep it free from pollution.

### **Peace Education**

The basic idea of peace education is to develop values and attitudes to interact with others and the surroundings in a peaceful and friendly manner. It is essential to include content areas that reflect values like avoiding conflicts and situations leading to conflicts, peace and harmony.

### **Legal Literacy**

Knowledge and awareness about law is essential for all citizens of a democratic country. It is the need of the hour to include content areas that ensure legal literacy. Various programmes involving Law Clubs, Law Clinics etc. can be organized to create awareness of law.

### **Cyber Literacy**

The misuse of ICT and related crimes are on the rise. Awareness should be created among children on these activities. They should be given a clear idea about the proper use of Internet, e-mail and social networking sites. The curriculum should facilitate creating awareness among children regarding the punishment for cyber crimes and the ethics in the use of internet etc.

### **Media Literacy**

Media exerts a great influence on our society. It is impossible even to imagine a day without visual media. Visual media has tremendous influence on children. Therefore, the content area of the curriculum should contain various factors required to create critical media literacy.

### **Perspective on Sustainable Development**

The curriculum should spread the awareness that this earth exists

not just for the benefit of mankind. An understanding regarding the environmental challenges, human interventions which cause harm to environment, and how nature can be protected from such destructive activities etc. is the need of the hour. The curriculum should also uphold the enquiry how environment and development can go hand in hand and perspectives regarding sustainable development and views. One of the aims of the curriculum is to present perspectives on consistent development and create a comprehensive awareness about environment.

### **Adolescent Education**

The possibility of including content areas on adolescent education should be explored with the help of child psychologists, health workers, doctors and teachers. It is also important to address the doubts of learners regarding health and hygiene in a scientific manner.

### **Consumer Culture**

Facts concerning the negative aspects of consumerism have to be included in the curriculum. Consumer laws and our rights as consumers should be dealt with in the curriculum.

### **Anti-drug and intoxicant attitude**

We should realise the harmful effect of alcohol, drugs, tobacco and other narcotics on the health of children. The future generation should be saved from the evil tentacles of this menace. Pictures, pamphlets and visuals on the physical and mental effects of drug abuse, as examples, can be included in the content areas.

### **Gender Justice**

The curriculum should ensure gender justice and gender equality. Discrimination on the basis of gender should not be reflected in the content areas. It is the responsibility of teachers to ensure gender justice while carrying out learning activities.

### **Frugality**

Children should be taught the basic lessons of frugality at the primary level itself. Explain the importance and relevance of the habit of frugality. Students can also be given practical training in frugality.

### **Road Safety**

Traffic rules and practical suggestions to avoid road accidents are part of road safety. Children should develop the civic awareness that the road is a public place and that everybody has the right to use it. Activities related to road safety should also be given importance.

Learning experiences in these areas should be incorporated naturally in the transaction of the curriculum. While choosing the concepts of various subjects and arranging learning activities, enough consideration should be given. Knowledge, skill and attitude should be stressed in the process of teaching learning process. It should also be possible to perform continuous evaluation to find out whether the objectives have been accomplished. Activities of various clubs, SPC, NCC, Scouts and Guides, JRC, Vidya Rangam, Kalasahithya Vedi, Gandhi Darshan etc., can be platforms to develop values, attitudes and commitment.

### **Right Based Education**

UNESCO had taken initiatives to decide on the rights of children and spread them world wide. As a result of this, legislation has been made in many countries to protect the rights of children. The Right to Education Act passed in 2009 in India, is an important milestone in this matter. The responsibility of protecting the rights of children becomes the duty of adults. Right to Education can be divided into three areas.

- Participation
- Provision
- Protection

#### ***Participation***

- My opinion is sought when decisions concerning me/ children are taken.
- My interests are given priority when decisions are taken.
- I am given the opportunity to participate in activities which are compatible with my ability and limitations.
- I am able to go through a learning process which is flexible enough to nurture my abilities and overcome my limitations.

- My opinions are given due respect and value.
- My friends and I get active participation in the activities in class.
- I get opportunities to display my talent and abilities.

#### ***Provision***

- I get the service of teachers who have the required qualification and who constantly update their knowledge.
- I get learning -experience in the prescribed time.
- I get a classroom ambience conducive to physical and psychological growth.
- My teachers are able to make learning materials required for learning activities available.
- I get materials and opportunities for the growth of art and physical education.
- I also get career guidance for securing employment in future.

#### ***Protection***

- I do not experience any kind of discrimination in or out of school.
- I am not ignored by any one in any manner.
- I am not harassed either physically or mentally.
- I can interact with my teachers without any fear.
- Though I am a child, every one respects and values my privacy.
- I am convinced that I will be safe both at home and at school.
- My school lends me a helping hand to further strengthen and empower me when I face physical and emotional problems.

If these are the rights of children, how far can I ensure these rights? What steps should I take further to ensure these rights? Every teacher should think about this.

#### **Mentoring**

RTE considers the teacher as a 'mentor'. Mentoring has much relevance and significance in the comprehensive school development project.

The teacher - student relationship has undergone significant changes. A teacher should function not as a person who distributes/ dispenses

knowledge, but as a facilitator who co-ordinates the various opportunities of students to gain knowledge.

In reality, school is a second home for the child and teachers are the members of his/her family. A teacher should understand that all children do not receive love, consideration, security, appreciation and recognition etc., equally at home. The responsibility of a teacher becomes complete only when he/she realises this and is able to express these feelings accordingly to each child. Only then will a school become a home.

Only when a teacher becomes a mentor and a facilitator who helps gain learning outcomes, he/she will be a teacher of the new era.

When the teacher becomes a co-guardian, children get guidance, advice, support and opportunity to improve. The teacher as mentor should make interventions in the role of an experienced predecessor. Assistance for awareness and counselling are part of this. An effective mentor can bring out the hidden talents of a child.

**Through mentoring:**

- the teacher and the student enjoy proper learning experiences.
- the knowledge-area of the child and the teacher widens.
- the bond between the student and the school is strengthened.
- personality development and learning development of the child are ensured.
- collective thinking, decision- making and collective effort are made possible.
- the relationship between parents and school is strengthened and an overall view of the learner's learning process is created.
- the participation of the learner in arts and sports can be assessed.

Mentoring has to be manifested as a process which caters to personality development and interest in learning. It should also help in continuous assessment. Notes related to mentoring experiences should be recorded in the Cumulative Record. All the teachers in the school should act as mentors of students. All learners should get an experience of mentoring. The class may be divided into small groups and different teachers can be given the responsibility of evaluating the progress of each group.

## **Code of Professional Ethics for School Teachers**

### **1. Responsibility towards Students**

The teacher;

- 1.1 Treats all students with love and affection.*
- 1.2 Respects the value of being just and impartial to all students irrespective of their caste, creed, religion, sex, economic status, disability, language and place of birth.*
- 1.3 Facilitates students' physical, social, intellectual, emotional, and moral development.*
- 1.4 Respects basic human dignity of the child in all aspects of school life.*
- 1.5 Makes planned and systematic efforts to facilitate the child to actualise his/her potential and talent.*
- 1.6 Transacts the curriculum in conformity with the values enshrined in the Constitution of India.*
- 1.7 Adapts his/her teaching to the individual needs of students.*
- 1.8 Maintains the confidentiality of the information concerning students and dispenses such information only to those who are legitimately entitled to it.*
- 1.9 A teacher refrains from subjecting any child to trauma, fear, anxiety, physical punishment, sexual abuse and emotional and mental harassment.*
- 1.10. Protects a child from all forms of sexual abuse.*

### **2. Obligations towards parents, community and society**

A teacher;

- 2.1 Establishes a relationship of trust with parents/guardians in the interest of the all round development of students.*
- 2.2 Desists from doing anything which is derogatory to the respect of the child or his/her parents /guardians.*
- 2.3 Strives to develop respect for the composite culture of India among students.*
- 2.4 Keeps the country top most in mind, refrains from taking part in such activities as spreading feelings of hatred or enmity among different communities, religious or linguistic groups.*

### **3. Obligations towards the profession of teaching and towards colleagues:**

A teacher:

- 3.1 *Strives for continuous professional development.*
- 3.2 *Creates a culture that encourages purposeful collaboration and dialogue among colleagues and stake holders.*
- 3.3 *Takes pride in the teaching profession and treats other members of the profession with respect and dignity*
- 3.4 *Refrains from engaging himself/herself in private tuition or private teaching activity.*
- 3.5 *Refrains from accepting any gift, or favour that might impair or appear to influence professional decisions or actions.*
- 3.6 *Refrains from making unsubstantiated allegations against colleagues or higher authorities.*
- 3.7 *Avoids making derogatory comments about colleagues, especially in the presence of pupils, parents or colleagues.*
- 3.8 *Respects the professional standing and opinions of his/her colleagues*
- 3.9 *A teacher maintains confidentiality of information regarding colleagues and dispenses such information only when authorized to do so.*

### **Teacher Planner**

Teacher planner is a record of daily teaching planning. The teacher should develop the process page by carrying out the activities given in the teacher text and text book with the aim of achieving learning outcomes. However, these activities should be done in a flexible manner, adopting techniques suitable for the students of her class.

The process page should contain planning that includes assessment along with learning activities. Information obtained through continuous assessment should also be included on the feedback page.

A teacher planner should contain learning activities conducive for precise and meaningful concept- formation. The teacher should prepare a reflection note based on the information gathered through learning activities and assessment implemented in a week. It should be discussed in SRG/ Subject Council. Further planning notes should be made by the teacher based on these notes.

The format of a teacher planner is given below.

***Teacher Planner***

Name of the unit/ lesson :  
Date :  
Expected time :  
Learning outcomes :  
Concepts / Ideas :  
Skills :  
Language elements  
(only for language ) :  
Discourses  
(only for language ) :  
Values, Attitudes :  
Learning aids :  
Expected Products :

**Process Page**

Process containing activities  
and assessment.

**Assessment Page**

Assessment details should be  
included here.



## Reflections

### My findings, realisations

(Based on the ideas obtained through the assessment of learning activities)

- 
- 
- 
- 

### Extended Activities and Remedial Measures - Hints

- 
- 
- 
-



# Assessment Approach

Learning is a natural and continuous process. For effective learning, learning experiences should be based on specific objectives and centred on learning outcomes. Teachers and learners should be aware of the concepts and skills to be acquired through learning. Learning strategies should be planned according to the learning outcomes associated with each lesson. They should be linked to real life situations and presented to the learners.

How far are the acquired concepts and skills sufficient in ensuring learning outcomes? How many learners are yet to acquire the learning outcomes? What are the extended activities to be provided? How can they be provided? These should be the concerns of teachers as part of assessment.

Assessment **of** Learning is the process of assessing the learning outcomes acquired after the transaction of a unit. The proficiency of the learner and his level of excellence are evaluated here. This is just one phase of assessment.

There is also a process of correction which involves a critical self analysis of the concepts and awareness gathered through learning and internalizing the changes. This can be considered as self-assessment. Thus, learning takes place through self-assessment. This can be called Assessment **as** Learning. The learner becomes aware of how to learn more effectively (Learning to Learn) through this.

Assessment for learning and assessment as learning should be intensely emphasised to make learning more effective. The approach which gives importance to assessment process for making learning more effective must be adopted.

## **Continuous and Comprehensive Evaluation (CCE)**

Learning is a continuous process taking place in the learner. Hence, the assessment process to examine the concepts and skills acquired should also be continuous. By comprehensive assessment, we mean the assessment of the learner in cognitive as well as socio-emotional areas. Hence, we have adopted a continuous and comprehensive evaluation system.

## CCE Areas

CCE is carried out in two areas;

1. Cognitive area
2. Socio - emotional area

### Assessment regarding development in cognitive domain

The subjects taught at higher secondary level like Language, Science Humanities, Commerce, Health and Physical Education come under cognitive area. Learning outcomes acquired in each subject should be evaluated. Two types of evaluation are suggested here.

1. Continuous Evaluation (CE)
2. Term Evaluation (TE)

### Continuous Evaluation (CE)

Three types of CE are suggested.

1. **Learning Process assessment**
2. **Portfolio Assessment**
3. **Unit based assessment**

#### 1. Learning Process Assessment

Both the teacher and the learner plan various activities to acquire learning outcomes. The teacher has evaluated various factors like the participation of the learner in the learning process, excellence of the learner in performance and presentation, creativity of the learner, acquisition of desired skills etc. The indicators given below can be used for evaluation.

1. Participation in activity
2. Conceptual understanding
3. Acquisition of skills
4. Performance / Presentation
5. Recording / Preparation

When the process -assessment is carried out, the assessment done should be based on each indicator. For example, when evaluation for the indicator 'participation in activity' is done, the learners should be categorized as excellent, good, average and those who need improvement. This has to be recorded in the page for assessment in

Teacher Planner. All learners have to be assessed and recorded with reference to each indicator in every term.

Opportunity for self-assessment, peer assessment and teacher-assessment should be given in process-assessment.

### **Activity log**

Activity log is an important document required for the assessment of the cognitive area. It helps to complete various activities according to learning processes. The creativity of the learner, thought processes, language skills, socio- emotional domain etc are reflected in the activity log. An activity log should contain details like the various strategies adopted for the transaction of lesson. The additional information given by teachers to strengthen the learning process too can be recorded in the activity log.

## **2. Portfolio Assessment**

Portfolio is the collection of all products formed during the various stages of learning activities. It has the duty to give a learner, parents and the teacher feedback regarding learning.

The following should be included in a portfolio.

- o Activity log
- o Other learning documents, pictures, collections, writings, learning materials, creations made through ICT etc.
- o Creative works
- o Work sheets

The following indicators can be used for portfolio assessment.

- o Clarity of concept
- o Attainment of concepts
- o Appropriate design
- o Completion
- o Originality

### **Method to calculate scores of learning process and portfolio**

It is not necessary to record the score of all students calculated using indicators given for each activity. Performance of an entire term should be evaluated using the indicators. The notes in teacher planner, records in activity log etc should be consolidated at the

end of each term and learners should be categorised on the basis of their participation as Excellent, Good, Average, and Need improvement and 4/3/2/1 scores should be given accordingly. All five indicators have to be considered and score should be given for each indicator. The maximum score can be calculated as 20.

### **3. Unit based Assessment**

In a unit, activities for various learning outcomes are distributed in an inter-related manner. This is comprehensive in nature. While assessing a unit, this comprehensiveness (considering all the learning outcomes) is assessed. Oral assessment, quiz programme, open book assessment, preparation of questions, identifying the indicators and assessment of creative writing can be considered for unit assessment. Rating scale and check list to measure the achievement of a learner in a particular unit can be used. Unit assessment should take place naturally along with learning.

For unit assessment, points have to be awarded on the basis of indicators and converted to grades. These grades have to be recorded in the prescribed format. As there is more than one assessment in a term, the average of the assessment of all the units has to be recorded at the end of the term. Teacher has to prepare indicators suitable for the tools used in assessment.

#### **Open Book Assessment**

An “open book assessment” is one in which examinees are allowed to consult their class notes, textbooks, and other approved materials while answering questions. It is ideally suited to programmes that especially aim at developing the skills of critical and creative thinking. The open material may take one of the main forms; a textbook or alternative reference materials, or the students’ own notes. The types of material allowable must be made explicit to all students in advance of the assessment. Open-book assessments often comprise tasks based on a problem or argument to which the student is then required to respond, employing their knowledge of the subject and making use of the reference material as appropriate. Unit based assessment can be done in the form of open book assessment. It can be given after completing the unit, integrating all the learning outcomes. This assessment can be given for individual attempt first. Then the same can be allowed to be discussed in groups. Thus learning can be ensured in every learner.

### **Advantages of open-book Assessment**

- They assess not only students' capacity to construct a coherent response to the assessment task, but also require a demonstration of their ability to use resource material effectively.
- By allowing students access to relevant reference material, open-book assessments reduce the need to memorise information, and can therefore allow students to concentrate on demonstrating their ability to understand and apply this information to the question.
- By providing students with reference material prior to the assessment, it may give them greater confidence when taking these assessments and therefore produce a more accurate account of their achievements.
- Students can use revision time more constructively, focusing on reinforcing their understanding of the subject rather than attempting to memorise information.
- Home assignments and other learning experiences already prepare the students to solve problems with the assistance of external resources, so open-book assessments are quite natural in nature.

### **Preparing for an Open Book Assessment**

- Read the chapters ahead of time. Don't expect to find quick answers during the assessment.
- Know where to find everything. Observe the concepts and make your own outline. This reinforces the structure of the content in your mind.
- Mark all important terms with sticky notes and flags. If the teacher allows it, mark your texts wherever you notice important concepts and terms.
- Review notes for themes. Your teacher's comments usually provide an overview of the themes and concepts that appear on assessment. You won't always get this by reviewing the book alone.
- Make your own notes if allowed, and write down important formulas or concepts that you've covered in class.

### **Method of calculating CE**

The maximum score for learning process, portfolio and unit based assessment will be 20 each in every subject. Term level recording can be done calculating the average of them. To consolidate these marks, the format given in Annexure - 1 can be used.

### **Term Evaluation (TE)**

It is essential to assess the learning outcomes achieved through learning activities by each learner at the end of every term. The assessment of languages should be made considering areas like discourses, language elements, language skills based on the learning outcomes in the units considered in each term. Question models can contain various questions which stress the content areas and skills. For other subjects, assessment should be done based on the content- area of units considered in the term. Questions to assess skills and ideas which lay stress on learning outcomes can be prepared.

The question paper should be prepared after first preparing a design and then a blue print of question paper giving proper weights to units and learning outcomes, various thinking skills and different form of questions. Suitable scoring key and marking scheme should be prepared for each question and assessment should be done based on this scheme. Question-wise analysis should be prepared to review whether the questions are in accordance with the blue print and necessary editing should be done in the questions.

### **Details of thinking skills**

Thinking skills are the mental processes that we apply when we seek to make sense of experiences. While setting the question paper, due weight should be given to the thinking skills, so as to ensure meaningful learning in every learner. Coverage of the range of skills has to be ensured in the question paper which expects the learners to respond within a stipulated period of time of assessment, keeping in view the difficulty level.

According to Anderson and Krathwohl ('A Taxonomy for Learning, Teaching and Assessing – Revised Blooms taxonomy') the range of categories, specific thinking skills/processes with its alternative processes/terms is given as follows;

| CATEGORY/<br>PROCESSES   | ALTERNATIVE TERMS   |
|--------------------------|---|
| <b>1. Remember</b>       | <b>Retrieve relevant knowledge from long-term memory</b>  |
| 1.1. <i>Recognising</i>  | identifying- (e.g. Recognize the dates of important events in Indian history)   |
| 1.2. <i>Recalling</i>    | retrieving - (e.g. Recall the major exports of India)   |
| <b>2. Understand</b>     | <b>Construct meaning from instructional messages, including oral, written and graphic information</b>   |
| 2.1. <i>Interpreting</i> | clarifying, paraphrasing, representing, translating (e.g. Write an equation [using B for the number of boys and G for the number of girls] that corresponds to the statement 'There are twice as many boys as girls in this class')   |
| 2.2. <i>Exemplifying</i> | illustrating, substantiating (e.g. Locate an inorganic compound and tell why it is inorganic)   |
| 2.3. <i>Classifying</i>  | categorizing, subsuming (e.g. Classify the given transactions to be recorded in Purchase returns book and Sales returns book)   |
| 2.4. <i>Summarising</i>  | abstracting, generalizing (e.g. Students are asked to read an untitled passage and then write an appropriate title.)  |
| 2.5. <i>Inferring</i>    | concluding, extrapolating, interpolating, predicting (e.g. a student may be given three physics problems, two involving one principle and another involving a different principle can be asked to state the underlying principle or concept the student is uses to arrive at the correct answer.) |
| 2.6. <i>Comparing</i>    | contrasting, mapping, matching (e.g. Compare historical events to contemporary situations)  |
| 2.7. <i>Explaining</i>   | constructing models (e.g. the students who have studied Ohm's law are asked to explain what happens to the rate of the current when a second battery is added to a circuit.)  |
| <b>3. Apply</b>          | <b>Carry out or use a procedure in a given situation</b>  |
| 3.1. <i>Executing</i>    | Carrying out (e.g. Prepare Trading and Profit and loss Account from the Trial Balance given to and find out the net profit.)  |



|                             |   |
|-----------------------------|---|
| 3.2. <i>Implementing</i>    | using (e.g. Select the appropriate given situation where Newton's Second Law can be used)   |
| <b>4. Analyse</b>           | <b>Break material into its constituent parts and determin how the parts relate to one another and to an overall structure or purpose</b>  |
| 4.1. <i>Differentiating</i> | discriminating, distinguishing, focusing, selecting (e.g. distinguish between relevant and irrelevant numbers in a mathematical word problem)   |
| 4.2. <i>Organising</i>      | finding coherence, integrating, outlining, parsing, structuring (e.g. the students are asked to write graphic hierarchies which best corresponds to the organisation of a presented passage.) |
| 4.3. <i>Attributing</i>     | deconstructing (e.g. determine the point of view of the author of an essay in terms of his or her ethical perspective)  |
| <b>5. Evaluate</b>          | <b>Make judgements based on criteria and standards</b>  |
| 5.1. <i>Checking</i>        | coordinating, detecting, monitoring, testing (e.g. after reading a report of a chemistry experiment, determine whether or not the conclusion follows from the results of the experiment.)     |
| 5.2. <i>Critiquing</i>      | judging (e.g. Judge which of the two methods is the best way to solve a given problem)  |
| <b>6. Create</b>            | <b>Put elements together to form a coherent or functional whole; reorganize elements into a new pattern or structure</b>  |
| 6.1. <i>Generating</i>      | hypothesizing (e.g. suggest as many ways as you can to assure that everyone has adequate medical insurance)   |
| 6.2. <i>Planning</i>        | designing (e.g. design social intervention programmes for overcoming excessive consumerism)   |
| 6.3. <i>Producing</i>       | constructing (e.g. the students are asked to write a short story based on some specifications)  |

### Health - Physical Education - Assessment Method

Health - physical education will be considered as a cognitive area from 2014-15 academic year. During the adolescent stage, the physical and mental development of a child strengthens further. The

learners should be given the opportunity to get a proper awareness of health habits and the need to engage in physical activities. A performance assessment of the health - physical education is suggested. Details regarding this are given in the higher secondary level source book.

### **Assessment in Socio - Emotional Area**

Assessment of social and emotional areas is as important as that of cognitive areas. Skills relating to Learning to know, Learning to do, Learning to live together and Learning to be should be considered here. The assessment of social and emotional areas should consider the following skills.

1. Communication skills
2. Interpersonal skills
3. Empathy
4. Coping with emotions
5. Coping with stress
6. Problem solving skills
7. Decision making
8. Critical thinking
9. Creative thinking skills
10. Self- awareness

The assessment should be carried out by teachers handling various subjects in cognitive areas. This assessment should be carried out as part of the learning process assessment in each subject. Along with the assessment of process skills, the assessment of related values and attitudes too should be done.

The skills in the socio - emotional area that can be beneficial for the proficiency of the learner should be identified and marked. The skills beneficial to each learner should be encouraged. The teacher can record these proficiencies in the Teacher Planner and the consolidated information in Annexure - 2.

### **Artistic, Social, Cultural and Vocational Proficiencies**

To ensure the all-round development of a learner at the higher secondary level, not only appreciative, creative and artistic skills should be encouraged but an attitude towards undertaking social-cultural services should be inculcated. Every learner should get an

opportunity at least once in a month to participate in such activities. Higher Secondary Youth Festival, Career Guidance, Social Extension activities, National Service Scheme, N.C.C and various clubs should be made use of towards this effect.

All students at the higher secondary level should participate in atleast one of these activities. The proficiency of the learner in participating can be given a special grade certificate.

|                            |           |
|----------------------------|-----------|
| For Excellence in activity | - A grade |
| Good                       | - B grade |
| Satisfactory               | - C grade |
| Participation              | - D grade |

### Assessment - Annual Consolidation

The annual overall score of CE is the best score obtained by the learner in 3 terms. This can be entered in the column titled 'Final Score' in the format given in Annexure - 2. It is the total CE score of the learner in each subject. Now find the TE of each subject and find the total score adding CE and TE. This is the total score of a learner in one subject. In the case of subjects with practicals, the final score is calculated by including the score for practicals too.

### Grading Scheme

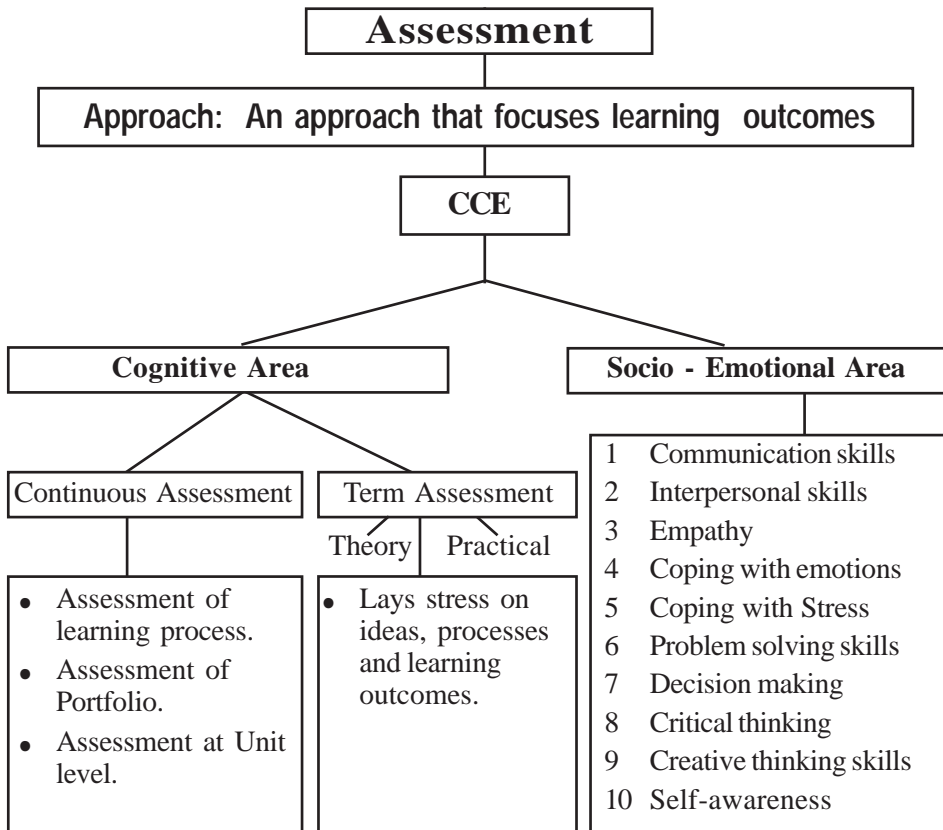
Higher Secondary level employs grading system to assess subjects in cognitive area. 9 Point Absolute Grading is used for this.

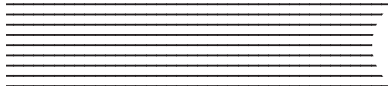
The table given below can be used for this.

| Score Percentage | Grade |
|------------------|-------|
| 90-100           | A+    |
| 80-89            | A     |
| 70-79            | B+    |
| 60-69            | B     |
| 50-59            | C+    |
| 40-49            | C     |
| 30-39            | D+    |
| 20-29            | D     |
| Below 20         | E     |

To be eligible for higher studies, the learner in the higher secondary should get a minimum of D+ (30-39 %) for each subject in the combined score of CE +TE (Public exam). In addition, he should score a minimum of D+ for TE too.

*The formats for assessment are given as Annexure I and II.*





## Subject Approach

The subject approach of Computer Science is revised and designed as per the general approach envisaged by the Kerala School Curriculum 2013. The syllabus is modified according to this approach. The remarkable aspect of the revision is that the subject is presented as a discipline, keeping its unique and real vision. Although the field of computer science continues to expand rapidly, it is not feasible to expand the size of the curriculum proportionately. As a result, the revision seeks to re-evaluate the essential topics in computing to make room for new topics within the available instructional hours. The curriculum approach of Computer Science takes two aspects into consideration - knowledge domain and process domain.

### **Knowledge domain**

The knowledge area of the curriculum of Class XII is a continuation to that of Class XI. The programming aspects to solve complex problems and handle complex data are introduced. It is followed by a strong foundation on complex data structures and their operations. Since we are in an era of Internet, a wide coverage is given to the contents required for designing web pages and developing web applications. The knowledge domain is concluded by showing the future and scope of computing discipline and giving an awareness about cyber crimes and IT laws.

The education that the higher secondary students in computer science receive adequately prepares them for the higher studies or workforce in a more holistic way than simply conveying technical facts. Indeed, soft skills (such as teamwork, verbal and written communication, time management, problem solving, and flexibility) and personal attributes (such as risk tolerance, humanity, patience, work ethic, identification of opportunity, sense of social responsibility, and appreciation for diversity) play a critical role in the world and hence the approach ensures the cultivation or nurturing of these skills.

### **Process domain**

The outcome-focussed curriculum follows transactional strategies ensuring constructivist, activity-based and process-oriented approach where learner is at the centre. This domain gives importance to gain the scientific and logical method and develop interest for deeper investigation. While transacting the concepts through activities, it should be ensured that the students are attaining the skills along with learning outcomes.

### **Learning Process**

While saying that computer science study should become process-based, it does not mean that it is merely conducting activities. Each activity must have an aim. It should be ensured that the student has reached the aim. Conducting activities and not consolidating may not help in acquiring the result. The student must be able to identify what he/she has achieved when a learning process is completed. This will help him/her for further studies.

Conclusions are made on the basis of the evidences got from learning activities. The evidences and the conclusions made therein have to be evaluated critically. While subjecting the method followed and the activities to evaluation again, the opportunity to identify errors, if any, and rectifying them opens up. The derived concepts are accepted or rejected only after subjecting them to criticism with high standards of academic discipline. This is possible only in classrooms that function in a democratic way where there is room for free and fearless interaction.

Concept formation occurs during interaction with the teacher, interaction with friends, observation activities or engaging in experiments. Hence the student gets various kind of experiences.

### **Teaching Learning Strategies**

The transactional strategies followed in the curriculum is learner centered and outcome focussed. Student has the responsibility and the right to construct knowledge. The teacher of modern times hence has to use instructional approaches that motivate the student to construct knowledge on his/her own.

Instructional strategies should be viewed as a social skill which is

part of the educational environment and not as a technique to be mastered. They are to be considered as important components of teacher-student interaction and not as teacher activities alone. While instructional methods are planned the social and psychological aspects of the learner need to be taken into consideration.

Some instructional strategies are listed below, the details of which are covered in the Teacher Text (Computer Science) of Class XI. We can apply any strategy ensuring that students attain the prescribed learning outcomes of Computer Science subject.

- Discussion
- Demonstrations
- Assignments
- Information Communication Technology
- Problem Solving
- Seminar
- Project
- Debate
- Outdoor learning (Field trip and Study tour)
- Lab Work

### **Activity Log Book**

The student carries out a number of activities as part of learning Computer Science. Observations, collections, data organisations in tables, analysis, consolidation, algorithms, flowcharts and programs are some of these. The Activity Log Book is a record of all activities that the student carries out in process based learning - problems faced, methods adopted to solve them and conclusions drawn. It is useful to the student as well as to others who want to evaluate the students' work and progress.

In short, the activity logbook is expected to be a comprehensive record of learning of a year. It is a record of all the learning experiences in Computer Science that a student is given during a year. It is also an important item in portfolio evaluation as it reflects the learning evidence of the learner.

### ***Recording***

- The discussion points, individual responses, group findings, consolidation points etc. as part of learning activities are recorded.
- Problems and their solutions, planning to carry out all learning activities, etc. are recorded.
- Seminar paper, notes on demonstrations, report of field visit, assignment, etc.

The teacher may examine the activity log book of all students frequently and verify the following:

- Systematic and orderly nature of entries
- Continuity and comprehensiveness
- The quality of the students' participation.

### **Library**

The library is as important as the laboratory. The school library is mostly used for language study. A lot of books related to the field of computer science and IT are available now. Books that are beneficial for learning and acquiring the concepts in depth are to be included in the school library as a separate category. Besides extra-reading materials, magazines and reading notes pertaining each lesson can be arranged in the class-reading corner. The students reading have to expand to greater knowledge domains.

#### **1. Structures and Pointers**

##### **1.1 Structures**





# Syllabus

## 1. Structures and Pointers

- 1.1.1 Structure definition
- 1.1.2 Variable declaration and memory allocation.
- 1.1.3 Accessing elements of structure
- 1.1.4 Nested structure
- 1.2 Pointers
  - 1.2.1 Declaration of Pointer Variable
  - 1.2.2 The Operators & and \*
- 1.3 Methods of memory allocation
  - 1.3.1 Dynamic Operators - new and delete
  - 1.3.2 Memory leak
- 1.4 Operations on pointers
  - 1.4.1 Arithmetic Operations on pointers
  - 1.4.2 Relational Operations on pointers
- 1.5 Pointer and array
- 1.6 Pointer and string
- 1.7 Pointer and structure

## 2. Concepts of Object Oriented Programming

- 2.1 Programming Paradigm
  - 2.1.2 Object - Oriented Programming (OOP) Paradigm
- 2.2 Procedural Programming V/s OOP
  - 2.2.1 Objects
  - 2.2.2 Classes
  - 2.2.3 Data Abstraction
  - 2.2.4 Data Encapsulation
  - 2.2.5 Modularity
  - 2.2.6 Inheritance
  - 2.2.7 Polymorphism

### **3. Data Structures and Operations**

- 3.1 Data Structure
  - 3.1.1 Classification of data structures
  - 3.1.2 Operations on data structures
- 3.2 Stack
  - 3.2.1 Implementation of Stack
  - 3.2.2 Operations on Stack
- 3.3 Queue
  - 3.3.1 Implementation of queue
  - 3.3.2 Operations on queue
  - 3.3.3 Circular queue
- 3.4 Linked List
  - 3.4.1 Implementation of linked list
  - 3.4.2 Operations on linked list

### **4. Web Technology**

- 4.1 Communication on the web
  - 4.1.1 Client to web server communication
  - 4.1.2 Web server to web server communication
- 4.2 Web server technologies
  - 4.2.1 Web server
  - 4.2.2 Software ports
  - 4.2.3 DNS servers
- 4.3 Web designing
- 4.4 Static and dynamic web pages
- 4.5 Scripts
  - 4.5.1 Types of scripting languages
  - 4.5.2 Scripting languages
- 4.6 Cascading Style Sheet
- 4.7 Basic concepts of HTML documents
  - 4.7.1 Basic structure of an HTML document
  - 4.7.2 Tags in HTML document

- 4.7.3 Container tags and empty tags
- 4.7.4 Attributes of tags
- 4.7.5 HTML Elements
- 4.8 Creating an HTML document
- 4.9 Essential HTML tags
  - 4.9.1 <HTML> - Starting an HTML page
  - 4.9.2 <HEAD> - Creating head
  - 4.9.3 <TITLE> - Creating a title
  - 4.9.4 <BODY> - Creating a body
- 4.10 Some common tags
  - 4.10.1 <H1>, <H2>, <H3>, <H4>, <H5> and <H6> - Heading tags
  - 4.10.2 <P> tag - Creating paragraphs
  - 4.10.3 <BR> tag - Inserting line break
  - 4.10.4 <HR> tag - creating horizontal line
  - 4.10.5 <CENTER> tag - Centering the content
  - 4.10.6 Text formatting tags
    - 4.10.7 <PRE> - Displaying preformatted text
    - 4.10.8 <ADDRESS> - Displaying the address
    - 4.10.9 <MARQUEE> - Displaying text in a scrolling Marquee
    - 4.10.10 <DIV> - Formatting a block of text
    - 4.10.11 <FONT> - Specifying font characteristics
- 4.11 HTML entities for reserved characters
- 4.12 Adding comments in HTML document
- 4.13 Inserting images

## 5. Web Designing using HTML

- 5.1 Lists in HTML
  - 5.1.1 Unordered lists
  - 5.1.2 Ordered lists
  - 5.1.3 Definition lists

- 5.1.4 Nested lists
- 5.2 Creating links
  - 5.2.1 Internal banking
  - 5.2.2 External linking
  - 5.2.3 Concept of URL
  - 5.2.4 Creating graphical hyperlinks
  - 5.2.5 Creating e-mail linking
- 5.3 Inserting music and video
- 5.4 Creating tables in a web page
  - 5.4.1 <TABLE> tag
  - 5.4.2 <TR> tag
  - 5.4.3 <TH> tag
  - 5.4.4 <TD> tag
  - 5.4.5 Table caption with <CAPTION> tag
- 5.5 Dividing the browser window
  - 5.5.1 <FRAMESET> tag
  - 5.5.2 <FRAME> tag
  - 5.5.3 Targeting frames
  - 5.5.4 Nesting of framesets
  - 5.5.5 <NOFRAMES> tag
- 5.6 Forms in web pages
  - 5.6.1 <FORM> tag
  - 5.6.2 <INPUT> tag
  - 5.6.3 <TEXTAREA> tag
  - 5.6.4 <SELECT> tag
  - 5.6.5 Grouping Form data with <FIELDSET> tag
  - 5.6.6 Form submission
- 5.7 Overview of HTML 5

## **6. Client Side Scripting using JavaScript**

- 6.1 Getting started with JavaScript
- 6.2 Creating functions in JavaScript
- 6.3 Data types in JavaScript
- 6.4 Variables in JavaScript:
- 6.5 Operators in JavaScript:
  - 6.5.1 Arithmetic Operators
  - 6.5.2 Assignment Operators
  - 6.5.3 Relational Operators (Comparison Operators)
  - 6.5.4 Logical Operators
  - 6.5.5 String addition Operator (+)
- 6.6 Control Structures in JavaScript
  - 6.6.1 if
  - 6.6.2 Switch
  - 6.6.3 for loop
  - 6.6.4 while loop
- 6.7 Built-in Functions:
- 6.8 Accessing values in a text box using JavaScript
- 6.9 Ways to add scripts to web page
  - 6.9.1 Inside <BODY>
  - 6.9.2 Inside <HEAD>
  - 6.9.3 External JavaScript file

## **7. Web Hosting**

- 7.1 Web hosting
  - 7.1.1 Types of web hosting
  - 7.1.2 Buying hosting space
  - 7.1.3 Domain name registration
  - 7.1.4 FTP client software
- 7.2 Free hosting
- 7.3 Content Management System
- 7.4 Responsive web design

## **8. Database Management System**

- 8.1 Concept of Database
  - 8.1.1 Need of database
  - 8.1.2 Advantages of DBMS
- 8.2 Components of the DBMS environment
- 8.3 Data Abstraction, Data Independence
  - 8.3.1 Data Independence
- 8.4 Users of Database
  - 8.4.1 Database Administrator
  - 8.4.2 Application programmers
  - 8.4.3 Sophisticated users
  - 8.4.4 Naive users
- 8.5 Relational Data Model
- 8.6 Terminologies in RDMS
  - 8.6.1 Keys
- 8.7 Relational algebra
  - 8.7.1 SELECT Operation
  - 8.7.2 PROJECT Operation
  - 8.7.3 UNION Operation
  - 8.7.4 INTERSECTION Operation
  - 8.7.5 SET DIFFERENCE Operation
  - 8.7.6 CARTESIAN PRODUCT Operation

## **9. Structured Query Language**

- 9.1 Structured Query Language
  - 9.1.1 Features of SQL
  - 9.1.2 Components of SQL
- 9.2 Working on MYSQL
  - 9.2.1 Opening MYSQL
  - 9.2.2 Creating a database
  - 9.2.3 Opening database
  - 9.2.4 Datatypes in SQL
- 9.3 SQL Commands

- 9.4 Creating tables
  - 9.4.1 Rules for naming tables and columns
  - 9.4.2 Constraints
  - 9.4.3 Viewing the Structure of a table
- 9.5 Inserting data into tables
- 9.6 Retrieving information from tables
  - 9.6.1 Eliminating duplicate values in columns using DISTINCT
  - 9.6.2 Selecting specific rows using WHERE clause
  - 9.6.3 Sorting results using ORDER BY Clause
  - 9.6.4 Aggregate functions
  - 9.6.5 Grouping of records using GROUP BY Clause
  - 9.6.6 Applying conditions to form groups using HAVING clause
- 9.7 Modifying data in tables
- 9.8 Changing the structure of a table
  - 9.8.1 Adding a new column
  - 9.8.2 Changing the definition of a column
  - 9.8.3 Removing column from a table
  - 9.8.4 Renaming a table
- 9.9 Deleting rows from a table
- 9.10 Removing table from a data base
- 9.11 Nested queries
- 9.12 Concept of views

## **10. Server side Scripting using PHP**

- 10.1 Overview of PHP
  - 10.1.1 Benefits of Using PHP
  - 10.1.2 Basics of PHP
- 10.2 Fundamentals of PHP
  - 10.2.1 Variables
  - 10.2.2 Data types

- 10.3 Control Structures in PHP
  - 10.3.1 Conditional Statement in PHP
  - 10.3.2 Loops in PHP
- 10.4 Arrays in PHP
  - 10.4.1 Indexed arrays
  - 10.4.2 Associative arrays
  - 10.4.3 foreach loops
- 10.5 Functions in PHP
  - 10.5.1 User defined function in PHP
  - 10.5.2 Built in functions
- 10.6 Three tier architecture in PHP
- 10.7 PHP forms
  - 10.7.1 PHP global variables
  - 10.7.2 GET and POST comparison
- 10.8 Connecting PHP to database (MYSQL)
  - 10.8.1 Establishing Connection of MYSQL database
  - 10.8.2 Creating a new table using PHP
  - 10.8.3 Inserting data into a table using PHP
  - 10.8.4 Updating data in a table using PHP

## **11. Advances in Computing**

- 11.1 Distributed Computing Paradigms
- 11.2 Distributed Computing
  - 11.2.1 Parallel Computing
  - 11.2.2 Grid Computing
  - 11.2.3 Cluster Computing
  - 11.2.4 Cloud Computing
- 11.3 Artificial intelligence
- 11.4 Computational intelligence
  - 11.4.1 Computational intelligence paradigms
  - 11.4.2 Application of Computational intelligence



## **12. ICT and Society**

### 12.1 ICT Services

12.1.1 e-Governance

12.1.2 e-Business

12.1.3 e-Learning

### 12.2 Information security

12.2.1 Intellectual Property Right (IPR)

12.2.2 Infringement

12.2.3 Cyber Space

12.2.4 Cyber Crimes

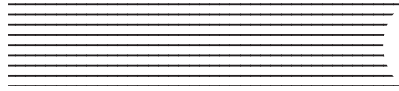
12.2.5 Cyber ethics

12.2.6 Cyber laws

12.2.7 Information Technology Act 2000 (Amended in 2008)

12.2.8 Cyber Forensics

12.2.9 Infomania



# Learning Outcomes

## **Chapter 1: Structure and Pointers**

- 1.1 Identifies the need of user defined data types and use structure to represent grouped data.
- 1.2 Creates structure data types and accesses elements to refer to the data items.
- 1.3 Uses nested structure to represent data consisting of elementary data items and grouped data items.
- 1.4 Develops C++ programs using structure data types to solve real life problems.
- 1.5 Explains the concept of pointers and uses pointer with the operator & and \*.
- 1.6 Compares the two types of memory allocation and uses dynamic operators new and delete.
- 1.7 Illustrates the operations on pointers and predict the outputs.
- 1.8 Establishes the relationship between pointers and array.
- 1.9 Uses pointers to handle strings.
- 1.10 Explains the concept of self referential structure.

## **Chapter 2: Concepts of Object Oriented Programming**

- 2.1 Compares various programming paradigms.
- 2.2 Lists the features of procedure oriented paradigm.
- 2.3 Lists the advantages of object oriented paradigm.
- 2.4 Explains the concepts of data abstraction and encapsulation, citing examples.
- 2.5 Explains inheritance and polymorphism with the help of real life examples.

## **Chapter 3: Data Structures and Operations**

- 3.1 Explains the concept of data structure by citing examples.
- 3.2 Classifies data structures based on different criteria.

- 3.3 Lists different operations on data structures and explains them.
- 3.4 Explains the organisation of stack data structure with the help of examples.
- 3.5 Develops algorithms for push and pop operations in a stack.
- 3.6 Explains the organisation of queue data structure with the help of examples.
- 3.7 Develops algorithms for insertion and deletion operations in a linear queue.
- 3.8 Identifies the advantage of circular queue over linear queue.
- 3.9 Explains the concept of linked list data structure and its advantages over arrays and other static data structures.
- 3.10 Develops procedures to create a linked list and to perform traversal operation.

#### **Chapter 4: Web Technology**

- 4.1 Explains the need of secure communications.
- 4.2 Describes web server and web hosting.
- 4.3 Differentiates static and dynamic web pages.
- 4.4 Identifies the difference between programming languages and scripts.
- 4.5 Explains different types of scripting languages.
- 4.6 Compares different types of scripting languages.
- 4.7 Identifies the basic HTML tags.
- 4.8 Lists fundamental HTML tags and attributes.
- 4.9 Classifies HTML tags.
- 4.10 Identifies the formatting tags and attributes.
- 4.11 Identifies the similarities and differences among formatting tags.
- 4.12 Uses the tags <PRE> and <DIV>.
- 4.13 Provides scrolling to the objects and contents in a web page.
- 4.14 Uses <FONT> Tag to make text attractive.
- 4.15 Uses comments in HTML.
- 4.16 Inserts images into html documents.

## **Chapter 5: Web Designing using HTML**

- 5.1 Distinguishes various types of lists available in HTML.
- 5.2 Links various web pages and sections within a webpage.
- 5.3 Embeds various audio, video files in a webpage.
- 5.4 Embeds inline audio video.
- 5.5 Lists various tags and attributes in creating a table.
- 5.6 Compares tags such as TD TH and their attributes and uses.
- 5.7 Illustrates the creation of Table.
- 5.8 Illustrates the use of frames and framesets.
- 5.9 Creates frames.
- 5.10 Explains the use of forms in HTML.
- 5.11 Lists the use of forms in html and its components.
- 5.12 Creates a webpage with all the features discussed so far.

## **Chapter 6: Client Side Scripting Using Javascript**

- 6.1 Distinguishes the use of client side and sever side scripting language.
- 6.2 Explains the need of client side scripting language.
- 6.3 Identifies the importance of JavaScript as the client side scripting language.
- 6.4 Uses JavaScript functions in a web page.
- 6.5 Explains different data types in JavaScript.
- 6.6 Uses correct variables in JavaScript.
- 6.7 Uses appropriate control structures in program codes.
- 6.8 Uses appropriate built-in functions in JavaScript.
- 6.9 Explains the method to access document elements using JavaScript.
- 6.10 Creates JavaScript functions that handle values in text boxes and combo boxes.

## **Chapter 7: Web Hosting**

- 7.1 Describes the use of a web server and the concept of web hosting.
- 7.2 Classifies different types of hosting.

- 7.3 Explains the ways to buy hosting space.
- 7.4 Registers a domain and hosts a website using FTP client software.
- 7.5 Explains the features of free hosting.
- 7.6 Identifies the use of Content Management Systems.
- 7.7 Describe the need for responsive web design.

### **Chapter 8: Database Management System**

- 8.1 Recognizes the need for files.
- 8.2 Identifies the major limitations of the conventional file management system.
- 8.3 Lists and explains the different advantages of the database management system.
- 8.4 Lists the various components of the DBMS and explains their purpose.
- 8.5 Recognizes the types of users and their roles in the DBMS environment.
- 8.6 Explains the levels of data abstraction and data independence in DBMS.
- 8.7 Explains the relational model by citing examples.
- 8.8 Uses the different terminologies in RDBMS appropriately.
- 8.9 Applies and evaluates the various operations in relational algebra.

### **Chapter 9: Structured Query Language**

- 9.1 Recognises the importance and features of Structured Query Language.
- 9.2 Explains the components of SQL. Distinguishes the features of DDL, DML and DCL commands.
- 9.3 Identifies the characteristics of MySQL Lists different data types and their features.
- 9.4 Explains the effect of different constraints.
- 9.5 Performs operations using DDL commands like CREATE, ALTER, DROP.

- 9.6 Uses DML commands like SELECT,INSERT, UPDATE, DELETE for data manipulationIdentifies various clauses associated with SQL commands and their purpose.Uses operators for setting different conditions.
- 9.7 Lists different aggregate functions and their usage.
- 9.8 Constructs nested queries for information retrieval.

### **Chapter 10: Server Side Scripting Using PHP**

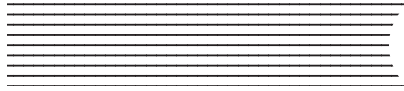
- 10.1 Lists the benefits of using PHP.
- 10.2 Explains the syntax of PHP code.
- 10.3 Illustrates various data types and operators used in PHP.
- 10.4 Constructs code from algorithm using control and looping structures in PHP.
- 10.5 Identifies the difference and use of different types of array.
- 10.6 Designs PHP functions for common tasks.
- 10.7 Describes the client server environment.
- 10.8 Selects the appropriate data submitting methods for different scenarios.
- 10.9 Identifies the role of database connectivity in the creation of dynamic webpages.

### **Chapter 11: Advances in Computing**

- 11.1 Identifies different distributed computing paradigms.
- 11.2 Compares serial computing and parallel computing.
- 11.3 Recognizes the need of grid computing.
- 11.4 Identifies cluster computing techniques.
- 11.5 Analyses the need of cloud computing methods.
- 11.6 Explains the role of artificial intelligence in modern computing.
- 11.7 Identifies different computational intelligence paradigms.
- 11.8 Explains applications of computational intelligence.

**Chapter 12: ICT and Society**

- 12.1 Uses various ICT services like e-Governance, e-Business and e-Learning.
- 12.2 Details e-Governance and its infrastructure and identifies its advantages and challenges.
- 12.3 Explains the concept of e-Business, its various components, advantages and challenges.
- 12.4 Recognises the concept and functions of e-Learning, uses e-Learning tools to overcome the limitations of traditional learning, identifies the advantages and challenges.
- 12.5 Lists and explains various intellectual property rights.
- 12.6 Explains cyber space.
- 12.7 Distinguishes different types of cyber crimes.
- 12.8 Explains cyber laws and ethics and scope of cyber forensics.
- 12.9 Identifies the importance of IT act.
- 12.10 Recognises infomania.



## Scheme of Work

| <b>Term</b> | <b>Month</b> | <b>Chapter</b>   |
|-------------|--------------|--|
| First       | June         | 1. Structures and Pointers (25 periods)<br>2. Concepts of Object Oriented Programming (10 periods) |
|             | July         | 3. Data Structures and Operations (20 periods)   |
|             | August       | 4. Web Technology (25 periods)   |
| Second      | September    | 5. Web Designing using HTML (20 periods)   |
|             | October      | 6. Client side scripting using JavaScript (20 periods)<br>7. Web Hosting (8 periods)               |
|             | November     | 8. Database Management System (12 periods)   |
|             | December     | 9. Structured Query Language (20 periods)<br>10. Server side Scripting using PHP (20 periods)      |
| Third       | January      | 11. Advances in Computing (10 periods)   |
|             | February     | 12. ICT and Society (15 periods)   |



## Part II

# 1

## Structures and Pointers

### Introduction

In class XI text book the learners have studied the method of developing C++ programs using fundamental data types and then using derived data type. This chapter starts with the discussion about structure, in which more than one data item can be grouped into a single unit. On the completion of this chapter, the learner will be able to develop programs using user defined data type which can represent an entity like student, employee, book etc. and hence the real world can be modelled in problem solving.

In the second part of this chapter, the use of pointers is discussed by introducing two memory allocation methods. After the completion of this section, the learner will understand the need of pointers in making effective use of computer memory and hence increasing program execution speed. Teacher can conduct a general discussion on the concept of pointers. At the end, each learner should be able to develop small programs and debug the same.

### Values and Attitudes

- ✓ Minimize steps in problem solving by grouping related facts and figures.
- ✓ Optimal use of available resources in real life.
- ✓ Ability to use resources based on requirements only.

## Unit Frame

Periods: 25

| Concepts/Ideas and Process skills  | Process/Activities with Assessments  | Learning outcomes  |
|--|--|--|
| Structure definition<br>✓ Identifying<br>✓ Explaining<br>✓ Communicating | General discussion on the concept of structure by introducing general format of structure definition.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Preparation of note</li> <li>➤ Program coding</li> <li>➤ Program code</li> </ul>  | 1. Identifies the need of user defined data types and uses structure to represent grouped data.        |
| Accessing elements of structure<br>✓ Identifying<br>✓ Observing          | General discussion by demonstrating the method of accessing structure elements using structure variables.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Program coding</li> <li>➤ Lab work to familiarize the execution of a simple program which accesses structure elements.</li> <li>➤ Program code</li> </ul> | 2. Creates structure data types and accesses elements to refer to the data items.                      |
| Nested structure<br>✓ Analyzing<br>✓ Communicating<br>✓ Problem solving  | Group discussion on defining a structure which contains another structure inside in it.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Program coding</li> <li>➤ Error correction</li> <li>➤ Lab work to familiarize the concept of nested data structure.</li> </ul>  | 3. Uses nested structure to represent data consisting of elementary data items and grouped data items. |
| Develop programs using structure<br>✓ Identifying<br>✓ Explaining        | Discussion and demonstration of program using structure.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Program code</li> <li>➤ Lab work</li> </ul>  | 4. Develops C++ programs using structure data types to solve real life problems.                       |

| Concepts/Ideas and Process skills  | Process/Activities with Assessments   | Learning outcomes  |
|--|---|--|
| Pointer declaration<br>✓ Observing<br>✓ Identifying<br>✓ Communicating         | General discussion on the concept of pointer and illustrate the declaration and use of pointer variables.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Preparation of notes</li> <li>➤ Program coding</li> <li>➤ Output presentation</li> <li>➤ Error correction</li> </ul> | 5. Explains the concept of pointers and uses pointer with the operator & and *.                          |
| Methods of memory allocation.<br>✓ Comparing<br>✓ Communicating<br>✓ Inferring | General discussion and comparison of two methods of memory allocation<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Preparation of notes</li> <li>➤ Program coding</li> </ul>  | 6. Compares the two types of memory allocation and uses dynamic operators <i>new</i> and <i>delete</i> . |
| Operations on pointers<br>✓ Observing<br>✓ Identifying errors<br>✓ Predicting  | Discussion and demonstration of operation on pointer variables.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Output prediction</li> <li>➤ Error correction</li> </ul>   | 7. Illustrates the operations on pointers and predict the outputs.                                       |
| Pointer and array<br>✓ Identifying<br>✓ Predicting                             | General discussion on the relationship between array and pointer<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Preparation of notes</li> <li>➤ Program coding</li> <li>➤ Output prediction and error correction</li> </ul>   | 8. Establishes the relationship between pointers and array.  |

| Concepts/Ideas and Process skills   | Process/Activities with Assessments   | Learning outcomes                                       |
|---|---|---|
| Pointer and string<br>✓ Observing<br>✓ Identifying                            | General discussion on the relationship between string and pointer.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Preparation of notes</li> <li>➤ Program coding</li> <li>➤ Output prediction and error correction</li> </ul> | 9. Uses pointers to handle strings.                     |
| Self referential structure<br>✓ Identifying<br>✓ Communicating<br>✓ Inferring | General discussion on the concept of self-referential structure.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Preparation notes</li> </ul>  | 10. Explains the concept of self-referential structure. |

### Process Assessment

- Involvement in coding, error correction output prediction.
- Lab works

### Portfolio Assessment

- Activity log book
- Practical log book
- Programme codes

### Unit Assessment

- Written tests may be conducted
- Problem can be given for developing programmes to solve them.

**Towards the Unit:**

(1 Period)

**User defined data type and structure****Suggested Activity:** Discussion, Demonstration and Problem Solving.

- Teacher illustrates the importance of user defined data type by discussing the points like:
  - o Fundamental data type can represent only elementary data item.
  - o Classification of data types into three in Class XI text book.
  - o Derived data type is discussed through the concept of array in Class XI.
  - o Need of data type to represent compound data like student details, employee details, etc. which is the user defined data type.
- Teacher introduces the concept of structure along with definition syntax.
- Students are asked to demonstrate or define structure for a given entity and they are also asked to write a program to access structure member.
- Teacher consolidates the discussion after ensuring participation of students in programming/problem solving.

**TE Questions**

1. *LO 1.1* *Type : Objective* *Score 1*

Structure is a \_\_\_\_\_ data type.

Fill in the blank by choosing the correct option from the following.

- |                 |             |
|-----------------|-------------|
| a. Fundamental  | b. Derived  |
| c. User-defined | d. Built-in |

PS : CA

SI : User defined

2. *LO 1.3* *Type : Short answer* *Score: 3*

Define a structure to represent employee details. Employee details are employee code, employee name, date of joining and place of employee.

PS : CG

SI : Definition of nested structure

3. *LO 1.4* *Type : Essay* *Score: 5*

Develop a program using a structure to read the details of 50 employees (Details are employee code, employee name and salary) and display the details of every employee after incrementing the salary by 35%.

PS : CA

SI : Structure definition and correct code to access the structure elements.

4. *LO 1.5* *Type : Short answer* *Score: 2*

Consider the following C++ program code.

```
int a=5,*p;
p=a;
cout<<p;
```

Identify the error in the above program segment and correct the error.

PS : CG

SI : p=a; Pointer variable can store only address.

5. *LO 1.5* *Type : Objective* *Score: 1*

Correct the program code given below.

```
int a=5;
float *p;
p=&a;
cout<<p;
```

PS : CA

SI : float\*p; is to be corrected as int\*p;

6. *LO 1.7* *Type : Objective* *Score: 1*

Assume that x is given a memory location at address 1000.

```
float x=4.5,*ptr;
ptr=&x;
cout<<ptr++<<"\t";
cout<<++ptr;
```

Choose the correct output for the above program segment.

- a) 1000      1002                  b) 1000      10004

c) 1002      1004                  d) 1002      1000

PS : CG

SI : b

7. *LO 1.2*                                  *Type : Objective*                                  *Score: 1*

Calculate the memory requirement for the following structure variable s1.

```
struct student
{
    int rno;
    char name[25];
    float height;
}s1;
```

PS : CA

SI : 33 bytes

8. *LO 1.6*                                  *Type : Short answer*                                  *Score: 3*

*Raju used four new operators and three delete operators in a program. Name the situation that he is going to face and explain the situation.*

PS : CA

SI : Memory leak. Explanation.

9. *LO 1.3*                                  *Type : Objective*                                  *Score: 3*

Explain the type of structure defined below and calculate the number of bytes required (in GCC) to store the structure variable s1.

```
struct student
{
    int rno,mark;
    char name[25];
    struct date
    {
        int dd,mm,yy;
    }doj;
}s1;
```

PS : CG

SI : Definition of Nested structure. 45 bytes

10. LO 1.2 *Type : Short answer* *Score: 2*

Write the declaration statement of a student structure variable named 's' which is initialized with admission number 19, name as 'sunil' and mark as 75.

PS : CA

SI : `student s={19, "sunil", 75};`

11. LO 1.2 *Type : Objective* *Score: 1*

Choose the right answer from the list.

Which is the structure member operator? (\* ? + .)

PS : CA

SI : .

12. LO 1.6 *Type : Short answer* *Score: 2*

Write a function definition to swap values of two integer variables using pointer.

PS : CA

SI : Correct function definition using pointer variables

13. LO 1.6 *Type : Short answer* *Score : 3*

Write C++ statement for the following:

- i) To declare an integer variable named *x* using new operator.
- ii) To initialize the integer pointer variable *x* with value 5.
- iii) To declare a dynamic array of ten integers named *x*.

PS : CG

SI : a) `int *x=new int;`

b) `int *x=new int(5);`

c) `int *x=new int[10];`

14. LO 1.10 *Type : Objective* *Score: 2*

"Self referential structure can be used for implementing linked list". Justify the statement.

PS : CA

SI : Correct justification/Self-referential structure contains a pointer to itself.



15. LO 1.4 *Type : Essay* *Score: 5*

Write a program to read admission number, name, mark1, mark2 and mark3 of students in a class. Then calculate total, average and grade obtained by each student [average  $\geq 90$  then grade is A+,  $\geq 80$  then grade is A and so on.]. Then display admission number, name and grade of all the students.

PS : CG

SI : Program with array of structures.

16. LO 1.8 *Type : Short answer* *Score: 2*

Consider the array declaration. Assume that the first element of array is stored in location 2020.

```
int a[]={2,5,8,9,4},*p1,*p2;
p1=a;
p2=&a[0];
cout<<p1<<"\t"<<p2;
```

Predict the output and justify.

PS : CA

SI : Array name itself is a pointer which stores address of first element of an array.

17. LO 1.10 *Type : Short answer* *Score: 2*

"The dot(.) operator cannot be used for accessing structure member by using structure pointer variable " Say True or False. Justify your answer.

PS : CG

SI : Arrow (->) operator is used for accessing structure member by using structure pointer variable.

18. LO 1.6 *Type : Short answer* *Score: 3*

Differentiate between static and dynamic memory allocation with an example.

PS : CA

SI : Dynamic memory allocation during program execution and static memory allocation during program compilation.

```
int a[10]                static array
int * a= new int[10]    dynamic array.
```

### Info Box

- 1) In Turbo C++ and in some other compilers, the following array declaration is incorrect.

```
int n;  
cin>>n;  
int a[n];
```

Because array size must be a constant value.

But in GCC we can see that such an array declaration, in which array size is a variable, is correct. As per static memory allocation concept, this declaration is wrong.

- 2) Consider the following code:

```
char ch, *p;  
p=&ch;  
cout<<p;
```

The above code will not display the address of character variable 'ch'.

But the following statements

```
int a,*p;  
p=&a;  
cout<<p;
```

will display the address of integer variable a.

Hence, we can conclude that in the case of character data type, instead of displaying address, the content of the address will be displayed. If it is a character array, the display terminates only when null character is encountered. To get address of a character variable, we have to use (void\*) as prefix.

# 2

## Concepts of Object Oriented Programming

### Introduction

The learners were introduced to the syntax of the language C++ in the previous units (first year and second year). In this unit, they are introduced to the different methods in which the coding can be done and how these methods can make the program more efficient and the advantages of doing so. This unit introduces programming paradigms to the learners through the discussion of the Concept of Object Oriented Programming (OOP).

The first part of the unit explains procedural paradigm and lists its limitations. The next part introduces OOP paradigm and discusses its advantages. After this, each concept of OOP including objects, class, abstraction, data hiding modularity, inheritance and polymorphism are discussed in detail.

While discussing the concept of objects, teachers should take care to provide the learners with examples from both real life and programming (like arrays, stack etc.). Even though the implementation of OOP is not part of the syllabus, it would be better to allow learners to try out the three programs provided in info box in the student textbook, as part of their lab session. It will give them an insight into the OOP concepts. The code of the *school software* example discussed throughout this unit is implemented in procedural as well as OOP paradigm. This is given here for further discussion, which can also be tried by the learners.

**Values and Attitudes:**

- ✓ Identifies that there are different ways in which a problem can be approached and solved in a better way.
- ✓ Appreciates C++ as an OOP language.
- ✓ Identifies the importance of sharing of knowledge.

**Unit Frame**

Periods: 10

| Concepts/Ideas and Process skills   | Process/Activities with Assessments  | Learning outcomes   |
|---|--|---|
| <ul style="list-style-type: none"> <li>• Programming Paradigm</li> <li>✓ Communicating and understanding</li> <li>✓ Observing</li> </ul>  | Slide presentation and general discussion on the drawbacks of procedure oriented programming and advantages of OOP.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Preparation of notes.</li> <li>➤ Assignment on benefits of OOP.</li> </ul>  | <ol style="list-style-type: none"> <li>1. Compares various programming paradigms.</li> <li>2. Lists the features of procedure oriented paradigm.</li> <li>3. Lists the advantages of object oriented paradigm.</li> </ol> |
| <ul style="list-style-type: none"> <li>• Basic concepts of OOP</li> <li>✓ Observing</li> <li>✓ Communicating and understanding</li> <li>✓ Inferring</li> <li>✓ Classifying</li> </ul> | Slide presentation and general discussion on objects and classes, data abstraction, data encapsulation, modularity, inheritance and polymorphism.<br>Seminar on advantages of OOP.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Seminar Report.</li> <li>➤ Work Sheet.</li> <li>➤ Preparation of notes.</li> </ul> | <ol style="list-style-type: none"> <li>4. Explains the concepts of data abstraction and encapsulation, citing examples.</li> <li>5. Explains inheritance and polymorphism with the help of real life examples.</li> </ol> |

**Process Assessment**

- Seminar report on basic concepts and worksheet evaluation.

**Portfolio Assessment**

- Activity log book
- Assignment through e-mail
- Worksheets

### Unit Assessment

- Written tests may be conducted.

### Towards the Unit:

#### Programming Paradigm

(1 Period)

*Suggested activity: Slide presentation, discussion, assignment and preparation of notes*

- The teacher displays slides on the advantages of OOP.
  - Need for alternate paradigms.
  - Slides on important benefits of OOP (Object Oriented Programming).
  - Compares procedural programming and OOP.
- This activity offers the learners all the details about the benefits of using OOP.
  - Learners prepare a table showing the differences between procedural and object oriented programming.
- The teacher concludes the discussion with the following points
  - Major advantages when data is given more importance.
  - Instructs the students to prepare notes.

#### Basic concepts of OOP

(1 Period)

*Suggested activity: Demonstration, Seminar and Preparation of notes*

- The teacher demonstrates the concepts of OOP through slide presentation.
- The teacher illustrates the concepts and their architecture.
  - The learner observes the concepts.
- Learners identify the benefits of OOP in program development.
- The learners are expected to submit seminar reports to teacher.
- Instructs the students to prepare notes.

**TE Questions**

1. *LO: 2.1* *Type: Objective* *Score: 1*

C++ is a \_\_\_\_\_ paradigm language.

- a. Object oriented                      b. Procedural  
c. Both a and b                              d. None of the above.

PS : CA                                      SI: c

2. *LO: 2.2* *Type: Objective* *Score: 1*

C, Pascal, FORTRAN and BASIC are examples of \_\_\_\_\_ languages.

- a. Object oriented                      b. Procedural  
c. Both a and b                              d. None of the above.

PS : CA                                      SI: b

3. *LO: 2.2* *Type: Objective* *Score: 1*

To reduce the complexity, in procedural paradigm the functions associated with a common task are grouped into \_\_\_\_\_.

- a. Structures      b. Programs      c. Modules      d. Interface.

PS : CA                                      SI: c

4. *LO: 2.2* *Type: Objective* *Score: 1*

Data is undervalued in \_\_\_\_\_ paradigm.

- a. Object oriented                      b. Procedural  
c. Both a and b                              d. None of the above.

PS : CA                                      SI: b

5. *LO: 2.3* *Type: Objective* *Score: 1*

\_\_\_\_\_ is a prototype/blue print that defines the specification common to all objects of a particular type.

- a. Object              b. Class              c. Method              d. Interface.

PS : CA                                      SI: b

6. *LO: 2.3* *Type: Objective* *Score: 1*

\_\_\_\_\_ of the class are called individual instances.

- a. Object              b. Class              c. Method              d. Interface.

PS : CA                                      SI: a

7. *LO: 2.3*                      *Type: Objective*    *Score: 1*

Based on a class \_\_\_\_\_ number of objects can be created.

- a. 3                      b. 2                      c. Any                      d. 1.

PS : CA    SI: c

8. *LO: 2.4*                      *Type: Objective*    *Score: 1*

Calling member function of an object from another object is called \_\_\_\_\_.

- a. Sending letter    b. Calling function    c. Passing message    d. Switching

PS : CA    SI: c

9. *LO: 2.4*                      *Type: Objective*    *Score: 1*

In inheritance, the existing class is called the \_\_\_\_\_ class, and the new class is referred to as the \_\_\_\_\_ class.

- a. base, derived                      b. old, new    c. back, front    d. top, bottom

PS : CA    SI: a

10. *LO: 2.4*                      *Type: Objective*    *Score: 1*

In object-oriented programming, \_\_\_\_\_ refers to a programming language's ability to process objects differently depending on their data type or class.

- a. Encapsulation                      b. Abstraction  
c. Inheritance                      d. Polymorphism

PS : CA    SI: d

10. *LO: 2.4*                      *Type: Objective*    *Score: 1*

The process of giving different tasks to functions with the same name, but different signatures is called \_\_\_\_\_.

- a. Inheritance                      b. Function overloading  
c. Passing message                      d. Switching

PS : CA    SI: b

12. *LO: 2.5*                      *Type: Objective*    *Score: 1*

\_\_\_\_\_ is the concept of giving new meaning to an existing C++ operator.

- a. Function overloading                      b. Operator Overloading  
c. Messaging                      d. Switching

PS : CA    SI: b

13. *LO: 2.5*                      *Type: Objective*    *Score: 1*

\_\_\_\_\_ polymorphism refers to the binding of a function definition with the function call during runtime.

- a. Run time    b. Compile time  
c. Execution time                                      d. Load time

PS : CA    SI: a

14. *LO: 2.3*                      *Type: Short answer*    *Score: 2*

What is a class? Can one create any number of objects from a class?

PS : CA    SI: Definition of class. Yes

15. *LO: 2.3*                      *Type: Short answer*    *Score: 2*

What is an Object? Give an example.

PS : CA    SI: Object is the instance of a class. Proper example

16. *LO: 2.3*                      *Type: Short answer*    *Score: 2*

What are the basic concepts of OOP?

PS : CA

SI: Classes and Objects, Encapsulation, Data abstraction, Inheritance

17. *LO: 2.4. 2.5*                      *Type: Essay*    *Score: 5*

List a few features of object oriented programming.

PS : CA    SI: Any five points

18. *LO: 2.3*                      *Type: Short answer*    *Score: 2*

What is encapsulation?

PS : CA    SI: Binding of code and data together

19. *LO: 2.3*                      *Type: Essay*    *Score: 5*

What are the advantages of OOP?

PS : CA    SI: Any 5 advantages

20. *LO: 2.5*                      *Type: Essay*    *Score: 5*

Explain inheritance and list its types

PS : CA    SI: Definition, Listing of types



21. *LO: 2.4*                      *Type: Short answer*                      *Score: 3*

What is the relationship between a class and an object?

PS : CA

SI: A class acts as a blue-print, defines the properties, states and behaviors.

An object is an instance of the class.

22. *LO: 2.4*                      *Type: Short answer*                      *Score: 2*

What is the difference between data encapsulation and abstraction?

PS : CA

SI: Abstraction-Hiding the implementation; Encapsulation-clubbing of data and functions

23. *LO: 2.5*                      *Type: Short answer*                      *Score: 3*

What is Polymorphism? What are the different types of polymorphism?

PS : CA

SI: One interface and many forms. Compile time, Runtime

24. *LO: 2.5*                      *Type: Short answer*                      *Score: 3*

What is inheritance?

PS : CA

SI: Derived class; Base class; Inherits the properties of base class.

25. *LO: 2.3*                      *Type: Short answer*                      *Score: 2*

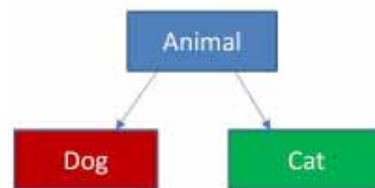
What are the benefits of using Inheritance?

PS : CA                      SI: Any 2 benefits

26. *LO: 2.5*                      *Type: Short answer*                      *Score: 2*

Identify the following from the picture.

- a. OOP concept
- b. Components



PS : CA

SI a. Inheritance, b.Base Class, Derived Class

27. LO: 2.4, 2.5

Type: Short answer

Score: 5

Can you connect the following with any of the OOP concepts.

- a. You have a mobile phone, you can dial a number using keypad buttons. You don't know how these are working internally.
- b. We invented aeroplane based on the mechanism of birds. So, aeroplane is derived form the base of birds.
- c. An architect will have the blueprints for a house. You can't live in it. Builders will look at the blueprints and use those blueprints to make a physical house. They can use the same blueprint to make as many houses as they want. Each house will have the same layout and properties.
- d. When you provide the user name and password and click on submit button in an e-mail program, it will show Compose, Inbox, Outbox, Sentmails etc. When you click on compose it will open, but the user doesn't know what are the actions performed internally.
- e. We behave differently with elders and friends. The same person behaves differently in different situations.
- f. A girl who is married and mother of 2 children, is teaching. She is a woman first, teacher at school, wife of someone at home, mother of her children, daughter of someone and friend of someone. A woman plays diffent roles in different situations.
- g. A software engineer can perform different tasks on different occasions depending on the task assigned to him. He can do coding, testing, analysis and designing depending on the task assigned.
- h. The word *Watch* can be used as a verb as well as a noun. Like "He is wearing a watch." or "Watch your actions". Thus we see that the same word can be used in different situations differently.
- i. Suppose you are a mobile phone manufacturer and you designed and developed a mobile phone design. Now, using machinery, you manufacture hundreds of the same model of mobile phone for selling.

PS : CG

- SI:
- a. Abstraction
  - b. Inheritance
  - c. Class and Object
  - d. Abstraction
  - e. Polymorphism
  - f. Polymorphism
  - g. Polymorphism
  - h. Polymorphism

## i. Class and Object

**Programs implemented for examples in the text book**  
*(This is provided as additional information. Students who are interested in programming may be encouraged with these programs.)*

## Program 2.1 Demonstration of Procedural Programming

```
#include <iostream>
using namespace std;

struct Student
{
    int regno;
    char name[20];
    int m1, m2, m3;
    float fee;
}S1;

struct Teacher
{
    int teacher_ID;
    char name[20];
    char subject[20];
}T1;
Student get_student();
void show_student(Student);
void update_fees(Student, float);
Teacher get_teacher();
void show_teacher(Teacher);
int main()
{
    //Body of main function
    S1 = get_student(); //Since S1 and T1, the variables of
    show_student(S1); //Student and Teacher structure are
    update_fees(S1, 1000.00); //declared public, they are
    show_student(S1); //accessible to any function here.
    T1 = get_teacher();
    Show_teacher(T1);
}

//To accept student data
```

```
Student get_student()
{
    Student S;
    cout << "Enter Register Number : ";
    cin >> S.regno;
    cout << "Enter Student Name : ";
    cin >> S.name;
    cout << "Enter Marks : ";
    cin >> S.m1 >> S.m2 >> S.m3;
    cout << "Enter Fees Deposited : ";
    cin >> S.fees;
    return (S);
}

//To display student data
void show_student(Student S)
{
    cout << "Register Number : " << S.regno;
    cout << "Student Name : " << S.name;
    cout << "Marks : "<<S.m1<<" "<<S.m2<<" "<< S.m3;
    cout << "Fees Deposited : " << S.fees;
}

//To update fees received
void update_fees(Student &S, float f)
{
    S.fees = S.fees + f;
}

//To accept teacher data
Teacher get_teacher()
{
    Teacher T;
    cout << "Enter Teacher ID : ";
    cin >> T.teacher_ID;
    cout << "Enter Teacher Name : ";
    cin >> T.Name;
    cout << "Enter Subject : ";
    cin >> T.subject;
    return (T);
}

//To display teacher data
void show_teacher(Teacher T)
```

```

{
    Cout << "Teacher ID : " << T.teacher_ID;
    cout << "Teacher Name : " << T.name;
    cout << "Subject : " << T.subject;
}

```

### Program 2.2 Demonstrates the implementation of OOP concepts

```

#include <iostream>
using namespace std;

class Student
{
protected:
    int regno;
    char name[20];
    int m1, m2, m3;
    float fees;
public:
    // interface to outside world
    void get_student()
    {
        cout << "Enter Register Number : ";
        cin >> regno;
        cout << "Enter Student Name : ";
        cin >> name;
        cout << "Enter Marks : ";
        cin >> m1 >> m2 >> m3;
        cout << "Enter Fees Deposited : ";
        cin >> fees;
    }
    // interface to outside world
    void show_student()
    {
        cout << "Register Number : " << regno;
        cout << "Student Name : " << name;
        cout << "Marks : " << m1 << " "
                << m2 << " " << m3;
        cout << "Fees Deposited : " << fees;
    }
    // interface to outside world
    void update_fees(float f)
    {

```

```

        fees = fees + f;
    }
};

int main()
{
    Student S1;
    S1.get_student(); //Sending Message
    S1.show_student(); //Sending Message
    S1.update_fees(1000.00); //Sending Message
    S1.show_student(); //Sending Message
    return 0;
}

```

### Program 2.3 Demonstrates the implementation of Inheritance

/\*The following code segment is to be attached with Program 2.2.\*/

```

class NewStudent : public Student
{
    private:
        int age;
        int standard;
    public:
        void get_student()
        {
            student::get_student();
            cout << "Enter Age : ";
            cin << age;
            cout << "Enter standard :";
            cin << standard;
        }

        void show_student()
        {
            Student::show_student();
            cout << "Age : " << age;
            cout << "Standard: " << standard;
        }

        void show_result()
        {
            int tot;
            if ((m1 <40) || (m2<40) || (m3<40))

```

```
        cout << "Failed";
    else
    {
        tot = m1 + m2 + m3;
        if (tot < 150)
            cout << "Passed";
        elseif (tot < 180)
            cout << "Second Class";
        elseif (tot < 225)
            cout <<"First Class";
        else
            cout <<"Distinction";
    }
};

/*Note that two main() functions are not allowed in a
single program */

int main()
{
    NewStudent N1;
    N1.get_student();
    N1.show_student();
    N1.show_result;
    return 0;
}
```

# 3

## Data Structures and Operations

### Introduction

This unit introduces learners to the concept of data structures and the various operations performed on them. Based on the data organizing principles and criteria, data structures can be classified into different types. This unit mainly focuses on the introduction of the basic concepts and operations of stacks and queues. The concept of stack and the main operations on stacks, push and pop, are discussed in detail.

In the next stage the learners are familiarized with queues and its operations. This unit also discusses the logical concept of circular queues. Finally, this unit explores the logical concept of linked lists and compares the difference between array and linked list. It also discusses the advantages of implementation of stacks and queues using linked lists over array. From this unit, the learners should get a concrete idea about the concept of some important data structures like stack, queue, linked list etc. The teacher should provide learners with maximum programs to create a solid idea on operation of stack and queue.

### Values and Attitudes

- ✓ Ability to use most efficient data structures.
- ✓ Sharing and caring through collaboration and cooperation.
- ✓ Approach a problem positively and arrive at solutions through logical thinking.



#### Unit Frame

Periods: 20

| Concepts/Ideas and Process skills   | Process/Activities with Assessments   | Learning outcomes   |
|---|---|---|
| Data structure<br>✓ Communicating<br>✓ Identifying  | General discussion on the concept of data structure.<br><b>Assessment:</b><br>➤ Activity log  | 1. Explains the concept of data structure by citing examples.                   |
| Classification of data structures<br>✓ Communicating<br>✓ Identifying<br>✓ Comparing        | Demonstration and General discussion on the various types of data structures.<br><b>Assessment:</b><br>➤ Activity log                           | 2. Classifies data structures based on different criteria.                      |
| Operations on data structures<br>✓ Communicating<br>✓ Identifying<br>✓ Comparing            | General discussion on different operations on data structures.<br><b>Assessment:</b><br>➤ Activity log, Worksheet                               | 3. Lists different operations on data structures and explains them.             |
| Stacks and implementation of stacks<br>✓ Communicating<br>✓ Identifying                     | Demonstration and General discussion on the organisation of stack data structure.<br><b>Assessment:</b><br>➤ Activity log                       | 4. Explains the organisation of stack data structure with the help of examples. |
| Operations on stacks<br>✓ Communicating<br>✓ Problem solving<br>✓ Applying                  | Illustration and general discussion on push and pop operations in a stack.<br><b>Assessment:</b><br>➤ Activity log, CPP files,                  | 5. Develops algorithms for push and pop operations in a stack.                  |
| Queues and implementation of queues<br>✓ Communicating<br>✓ Identifying<br>✓ Observing      | Demonstration and general discussion on organisation of queue data structure.<br><b>Assessment:</b><br>➤ Activity log                           | 6. Explains the organisation of queue data structure with the help of examples. |
| Operations on queues<br>✓ Communicating<br>✓ Problem solving<br>✓ Applying<br>✓ Identifying | Illustration and general discussion on insertion and deletion operations in a linear queue.<br><b>Assessment:</b><br>➤ Activity log, CPP files, | 7. Develops algorithms for insertion and deletion operations in a linear queue. |

| Concepts/Ideas<br>Process skills   | Process/Activities with<br>Assessments  | Learning outcomes  |
|--|---|--|
| Circular queue<br>✓ Communicating<br>✓ Identifying<br>✓ Observing  | Demonstration and general discussion on organisation of linear queue and circular queue.<br><b>Assessment:</b><br>➤ Activity log                              | 8. Identifies the advantage of circular queue over linear queue.   |
| Linked lists and implementation of linked lists<br>✓ Communicating<br>✓ Identifying<br>✓ Applying<br>✓ Observing | General discussion on the concept of linked list data structure.<br><b>Assessment:</b><br>➤ Activity log, Worksheet   | 9. Explains the concept of linked list data structure and its advantages over arrays and other static data structures. |
| Operations on linked list<br>✓ Communicating<br>✓ Problem solving<br>✓ Applying                                  | Illustration and general discussion to develop procedures to create a linked list and to perform traversal operation.<br><b>Assessment:</b><br>➤ Activity log | 10. Develops procedures to create a linked list and to perform traversal operation.                                    |

### Process Assessment

General discussions, Lab work, Activity Log preparation.

### Portfolio Assessment

Activity Log, CPP programs.

### Unit-wise Assessment

- Written test can be conducted using the questions given in the 'Know your Progress' section and Sample questions provided in the Textbook.
- Practical test can be conducted using the questions in stacks and queues.

Towards the Unit:

### Implementation of Queue: Algorithm to insert and delete elements into queue

(2 Periods)

*Suggested activity: Demonstration and general discussion*

- Teacher initiates the activity by asking the students some preliminary questions about the concepts of queues like definition, endpoints etc.
  - o Recollecting the concept of queue.
  - o The maximum size of queue may be set to 6.
  - o At the corner of the class room a place for students' queue can be considered.
  - o Initially there is no one in the queue. So front and rear are 0.
  - o Teacher calls one student to stand in the queue; hence front and rear:1.
  - o Teacher calls a second student to stand in the rear of the queue after setting rear position to 2.
  - o Call four more students and each student is added to the rear of the queue.
  - o Explains the situation of overflow by adding seventh student into the full queue.
  - o Remove one student from the front and set front position to front + 1.
  - o After removing all six students front and rear are 0.
  - o Again try to remove a student from the empty queue and explains the situation of underflow.

### TE Questions

1. *LO : 3.2*                      *Type : Objective*                      *Score : 1*

Choose the non-linear data structure from the following data structures?

- |          |                 |
|----------|-----------------|
| a. Stack | b. Queue        |
| c. Trees | d. Linked lists |

PS : CA

SI : c or Trees

2. *LO : 3.2*                      *Type : Objective*                                      *Scores : 1*

The process of combining the elements of two sorted data structures to form a new data structure is called \_\_\_\_\_.

PS : CA

SI : Merging

3. *LO : 3.6*                      *Type : Objective*                                      *Score : 1*

Fill in the blank in the given statement with the correct answer.

Queue follows \_\_\_\_\_ principle for organizing the data.

PS : CA

SI : First In First Out (FIFO).

4. *LO : 8.6*                      *Type : Objective*                                      *Score : 1*

State whether the following statement is true or false.

Linked list is a linear data structure.

PS : CA

SI : True

5. *LO : 3.2*                      *Type : Objective*                                      *Score : 3*

A table with three columns is given below. Find the best match for the items in column A from those given in column B and column C.

| Column A    | Column B | Column C |
|-------------|----------|----------|
| Stack       | FIFO     | Pointer  |
| Queue       | Header   | TOP      |
| Linked list | LIFO     | FRONT    |

PS : CG

SI : Stack - LIFO - TOP

Queue - FIFO - FRONT

Linked List - Header - Pointer

6. *LO : 3.8*                      *Type : Objective*                      *Score : 1*  
 State whether the following statement is true or false.  
 A queue in which two end points meet together is called linear queue.  
 PS : CA  
 SI : False
7. *LO : 3.5*                      *Type : Objective*                      *Score : 1*  
 If we place the characters 'D', 'C', 'B', 'A' in a stack (in that order), and then pop characters from stack, choose the correct order in which they will be popped?  
 a. A B C D                      b. A B D C  
 c. D C A B                      d. D C B A  
 PS : CA  
 SI : a or A B C D
8. *LO : 3.5*                      *Type : Objective*                      *Score : 1*  
 Choose the correct data structure used to store and retrieve the data in reverse order.  
 a. Stack  
 b. Queue  
 c. Array  
 d. Linked lists  
 PS : CA  
 SI : a or Stack
9. *LO : 3.2*                      *Type : Objective*                      *Score : 3*  
 A table with three columns is given below. Find the best match for the items in column A from those given in column B and column C.
- | Column A | Column B  | Column C                               |
|----------|-----------|--|
| Stack    | Front     | Insertion at rear end                  |
| Queue    | Subscript | Elements are inserted any where        |
| Array    | Top       | Insertion and deletion at the same end |
- PS : CG

SI: Stack - Top - Insertion and deletion at the same end  
 Queue - Front - Insertion at rear end  
 Array - Subscript - Elements are inserted any where

10. *LO : 3.5*                      *Type : Objective*                      *Score : 1*

Which of the following statements is true corresponding to a push operation on a stack?

- The new data element is placed at the top of the stack.
- The new data element is placed at the bottom of the stack.
- The new data element is placed at the middle of the stack.
- No change.

PS : CA

SI : The new data element is placed at the top of the stack.

11. *LO : 3.5*                      *Type : Short answer*                      *Score : 4*

Push and Pop are the two main operations in a stack.

- Distinguish between push and pop.
- Write an algorithm to insert an element into a stack.

PS : CA

SI :

- Definition of push and pop.
- Correct algorithm.

12. *LO : 3.7 and 3.8*                      *Type : Essay*                      *Score : 5*

- What are the limitations of linear queue?
- How does circular queue overcome the limitations of linear queue?

PS : CA

SI: Explain the limitations in insertion and deletion. Define the circular queue.

13. *LO : 3.9*                      *Type : Essay*                      *Score : 6*

What is a Linked list? Write the procedure to insert a new node into the linked list.

PS : CA

SI : Definition of linked list. procedure .

14. *LO : 3.9*                      *Type : Short answer*                      *Score : 3*

Linked list is a dynamic data structure. Justify this statement.

PS : CA

SI : Give the advantages of linked list.

15. *LO : 3.7*                      *Type : Short answer*                      *Score : 3*

Write an algorithm to insert a new element into a queue.

PS : CA

SI : Correct algorithm.

16. *LO : 3.6*                      *Type : Objective*                      *Score : 1*

If the characters 'D', 'C', 'B', 'A' are placed in a queue (in that order), and then removed one at a time, in what order will they be removed?

- a. A B C D
- b. A B D C
- c. D C A B
- d. D C B A

PS : CG

SI : d or D C B A

17. *LO : 3.7*

In a linear queue, insertion takes place in the rear end and deletion from the front end. Write the criteria for the following situations.

- a. Queue contains only one element.
- b. Queue is in overflow.

PS : CG

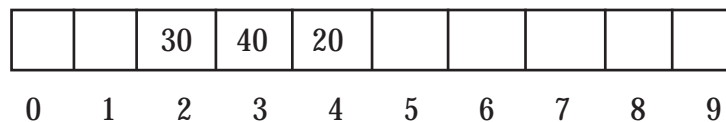
*Score : 3*

SI : Give the conditions.

18. *LO : 3.9*

The following figure shows the status of a queue at a specific time.

Front - 2    Rear - 4



*Figure 3.1*

Illustrate diagrammatically the following operations. Also, show the front and rear after each operation.

- a. Insert the element 50.
- b. Remove an element from the queue.
- c. Insert the elements 60 and 80 into the queue.
- d. Remove two elements from the queue.

PS : CG

Score : 4

SI : Correct values for front and rear.

### Assessment Worksheet 3.1

1. List the various operations performed on data structures.
2. What is merging?
3. The process of finding the location of a particular element in a data structure is called \_\_\_\_\_.
4. \_\_\_\_\_ is the technique of arranging the elements in either the ascending or descending order.

### Assessment Worksheet 3.2

1. Which node in the linked list is pointing at the beginning of the list?
2. A node in a linked list consists of \_\_\_\_\_ and \_\_\_\_\_.
3. If the header pointer points to null value, the linked list contains \_\_\_\_\_ elements.
4. Define linked list.
5. State true or false. Linked list is a dynamic data structure.



# 4

# Web Technology

## Introduction

Nowadays, Internet has emerged as a part of life. With the emergence of smart devices such as phones and tablet PCs Internet is going to have more roles in the future. In this chapter, we introduce web technology in general and HTML, the language of the web. Since the students are familiar with Internet, it will be easy for them to get accustomed to this subject.

A general idea about web technology is given to the students. Some common terminologies such as web server and DNS servers are discussed. Advantages of dynamic web pages over static web pages are stressed. Role of scripting languages in creating dynamic webpage is discussed. Server side and client side scripting languages are compared and some appropriate examples are mentioned.

After the introduction of web technology, HTML is introduced. Basic tags and attributes are demonstrated with the help of lab sessions. After the completion of this chapter, students should gain confidence to create a simple web page using HTML. This chapter should create a strong foundation for the advanced web programming which will be discussed in the coming chapters.

## Values and Attitudes

- ✓ Motivation to create and host web sites and become a part of large world community.
- ✓ Make accessing/sharing information easy to anyone from anywhere.
- ✓ Give everyone same web content, irrespective of the size and quality of the device they use.

## Unit Frame

Periods: 25

| Concepts/Ideas and Process skills  | Process/Activities with Assessments  | Learning outcomes  |
|--|--|--|
| Importance of secure communication over Internet.<br>✓ Identifying<br>✓ Explaining | General discussion.<br><b>Assessment:</b><br>➤ Preparation of notes  | 1. Explains the need of secure communications  |
| Web server and web hosting<br>✓ Identifying<br>✓ Observing                         | General discussion with the help of Internet.<br><b>Assessment:</b><br>➤ Preparation of notes                                  | 2. Describes web server and web hosting  |
| Static and dynamic web pages<br>✓ Identifying<br>✓ Observing<br>✓ Explaining       | Demonstration of different types of web pages-static and dynamic<br><b>Assessment:</b><br>➤ Preparation of notes<br>➤ Lab work | 3. Differentiates static and dynamic web pages.  |
| Programming languages and scripts<br>✓ Identifying<br>✓ Comparing                  | General discussion with the help of slide presentation.<br><b>Assessment:</b><br>➤ Preparation of notes<br>➤ Lab work          | 4. Identifies the difference between programming languages and scripts                                     |
| Different types of scripting languages<br>✓ Identifying<br>✓ Comparing             | Group discussion and consolidation.<br><b>Assessment:</b><br>➤ Preparation of notes<br>➤ Lab work                              | 5. Explains different types of scripting languages.<br>6. Compares different types of scripting languages. |
| Basic HTML elements<br>✓ Identifying<br>✓ Observing<br>✓ Explaining                | Demonstration of basic HTML tags with the help of computer.<br><b>Assessment:</b><br>➤ Preparation of notes<br>➤ Lab work      | 7. Identifies the basic HTML tags.<br>8. Lists fundamental HTML tags and attributes.                       |

| Concepts/Ideas and Process skills                                | Process/Activities with Assessments   | Learning outcomes   |
|--|---|---|
| List and classify HTML tags<br>✓ Identifying<br>✓ Comparing      | General discussion and comparing of different tags and attributes.<br><b>Assessment:</b><br>➤ Preparation of notes<br>➤ Lab work<br>➤ Worksheet 4.1 | 9. Classifies HTML tags   |
| Formatting tags<br>✓ Identifying<br>✓ Observing<br>✓ Classifying | General discussion followed by a group work.<br><b>Assessment:</b><br>➤ Preparation of notes<br>➤ Lab work<br>➤ Worksheet 4.2                       | 10. Identifies the formatting tags and attributes.<br>11. Identifies the similarities and differences among formatting tags.              |
| Other basic tags<br>✓ Identifying<br>✓ Observing                 | Demonstration with the help of computer.<br><b>Assessment:</b><br>➤ Lab work  | 12. Uses <PRE> and <DIV> tags.<br>13. Tags for moving objects and contents in a document.<br>14. Uses <FONT> Tag.<br>15. Comments in HTML |
| Inserting images<br>✓ Observing<br>✓ Presenting                  | Discussion and demonstration of images.<br><b>Assessment:</b><br>➤ Preparation of notes<br>➤ Lab work   | 16. Inserts images into html documents.   |

#### Process Assessment

- Involvement in the discussions, Lab work

#### Portfolio Assessment

- Activity log book, Practical log book, HTML documents
- Assessment worksheets.

#### Unit based Assessment

- Class test.

## Towards the Unit

### Formatting tags

(1 Period)

*Suggested activities: General discussion followed by group work.*

- Teacher selects a paragraph which contains various formatting like bold, underline, italics etc.
- It is shown using a projector or a computer.
- Teacher asks students to identify the formatting used in the paragraph.
- Students respond with random answers.
- Teacher notes down the responses one by one on the backboard.
- After noting the responses, teacher introduces formatting tags in <HTML> like <B>, <I>, <U> etc. one by one.
- After explaining each tag, teacher asks the students to format the above given paragraph with the help of appropriate tags.
- Each student attempts it in a workbook.
- Teacher randomly verifies some workbooks and makes necessary corrections if any.
- Ask every student to do it in the lab.

### TE Questions

1. *LO: 4.1*                      *Type: Short answer*                      *Score: 3*  
 Expand SSL? What it does?  
 PS: CG  
 SI : Secure Sockets Layer. It provides a standard security technology for establishing an encrypted connection between computers on Internet.
2. *LO: 4.1*                      *Type: Objective*                      *Score: 1*  
 "In order to communicate on the web, computers/devices need to understand each other. This is made possible by making all devices follow the same protocol". Name the protocol used here.

PS: CG

SI : Transmission Control Protocol/Internet Protocol (TCP/IP)

3. *LO: 4.2*                      *Type: Short answer*                      *Score: 3*

"To ensure faster Internet connectivity and redundant power supply, a web server is usually installed in a data center." List the requirement of a Data Center?

PS: CG

SI : A data center requires extensive backup power supply systems, cooling systems, high speed networking connections and security systems.

4. *LO: 4.2*                      *Type: Objective*                      *Score: 2*

Match the following.

| Port No. | Service |
|----------|---------|
| 80       | SMTP    |
| 443      | HTTP    |
| 25       | HTTPS   |
| 20       | FTP     |

PS: CG

SI : 80-HTTP, 443-HTTPS, 25-HTTPS, 20-FTP

5. *LO: 4.3*                      *Type: Objective*                      *Score: 1*

A website created for airline ticket reservation is of \_\_\_\_\_ type (Static/Dynamic)

PS: CG

SI : Dynamic

6. *LO: 4.4*                      *Type: Objective*                      *Score: 1*

To embed script within HTML document \_\_\_\_\_ tag is used.

PS: CG

SI : <SCRIPT>

7. *LO: 4.5*                      *Type: Short answer*                      *Score: 3*  
Compare client side scripting and server side scripting. Give an example for each scripting language.  
PS: CG  
SI : Client side scripting is executed on the client browser; it provides a quicker response to users. In server side scripting, scripts are executed in the server.
8. *LO: 4.5*                      *Type: Objective*                      *Score: 1*  
Select the wrong statement about JavaScript.  
1. It is a Client side scripting Language  
2. Any text editor can be used to write Java Script.  
3. It can have the extension .js  
4. It was developed by Microsoft.  
PS: CG  
SI : 4. It was developed by Microsoft.
9. *LO:4. 5*                      *Type: Objective*                      *Score: 1*  
Expand AJAX.  
PS: CA  
SI : Asynchronous JavaScript and Extensible Markup Language.
10. *LO:4.5*                      *Type: Short answer*                      *Score: 4*  
"It is possible to update parts of a webpage, without reloading the entire webpage". Name the technology used here. Write a short note on it.  
PS: CA  
SI : Ajax
11. *LO: 4.5*                      *Type: Short answer*                      *Score: 3*  
"ASP and JSP are server side scripting languages". Mention any three differences between them.  
PS: CG  
SI : ASP uses Internet Information Server (IIS). JSP uses, Apache

Tomcat web server. ASP files have the extension .asp where as JSP has .jsp as extension. ASP was released by Microsoft while JSP was developed by Sun Microsystems.

12. *LO: 4.6*                      *Type: Objective*                      *Score: 2*

Match the following:

|      |   |
|------|---|
| Ajax | a. A server side scripting environment developed by Microsoft.              |
| CSS  | b. Helps in updating portions of a web page instead of the entire web page. |
| ASP  | c. Open source general purpose scripting language.                          |
| PHP  | d. Style sheet language and formatting.                                     |

PS: CG

SI : Ajax -b, CSS-d, ASP-a, PHP-c

13. *LO: 4.7*                      *Type: Objective*                      *Score: 1*

State true or false.

"HTML is a case sensitive language".

PS: CG

SI : False

14. *LO: 4.18*                      *Type: Objective*                      *Score: 2*

Rearrange the following tags into similar groups.

| Empty Tag | Container Tag |
|-----------|---------------|
| <HR>      | <BR>          |
| <P>       | <HTML>        |
| <H1>      | <IMG>         |
| <TITLE>   | <HEAD>        |

PS: CG

SI : Empty: <HR>, <BR>, <IMG> (empty)

Container: <HTML>, <HEAD>, < TITLE>, <H1>, <P>

15. *LO: 4.8*                      *Type: Essay*    *Score: 5*

Differentiate between tags and attributes? Identify the tags, attributes and the values from the following HTML code.

```
<HTML>
  <HEAD>
    <TITLE> SAMPLE CODE</TITLE>
  </HEAD>
  <BODY Background="flower.jpg" Text= "yellow">
    What a beautiful day!!
  </BODY>
</HTML>
```

PS : CA

SI : Both Definitions

Tags: <HTML>, <HEAD>, <TITLE>, <BODY>

Attribute: Background, Text

Values: flower.jpg, yellow

16. *LO: 4.8*                      *Type: Short answer*    *Score: 3*

Consider the following code:

```
<HTML>
  <HEAD>
    <TITLE> our school web site</TITLE>
  </HEAD>
  <BODY background="school.jpg">
    Hello, Welcome to our home page!
  </BODY>
</HTML>
```

- Name any three container tags given in the code.
- What will be the background of this webpage?
- What will be the content shown in the browser?
- Give the code to replace the current background with red colour.



PS: CA

- SI : a. <HTML> , <HEAD> , <BODY> ,  
 b. Image named school.jpg  
 c. Hello, Welcome to our home page!  
 d. <BODY Bgcolor = "red">

17. *LO:4.8*                      *Type: Objective*    *Score: 2*

Match the following:

| Colour | Colour HEX |
|--------|------------|
| RED    | #FFFFFF    |
| GREEN  | #0000FF    |
| BLUE   | #FF0000    |
| WHITE  | #00FF00    |

PS: CA

SI : RED-#FF0000, GREEN-#00FF00, BLUE-#0000FF, WHITE-#FFFFFF

18. *LO: 4.8*                      *Type: Short answer*    *Score: 3*

Mr. Sahaf is not used to the Internet. When he moved the cursor through the text he noticed colour change in some text. When he clicked one of such texts it changed to a new colour and a new page came in. Explain the reason.

PS: CG

SI : Concept of hyper link

19. *LO: 4.9*                      *Type: Objective*    *Score: 4*

Observe the following web page:

- There are three headings. The tags used are <H1> , <H4> and <H6>. Guess the corresponding tags for each heading.
- Name the common attribute used by all the heading tags mentioned above.
- Give the value of attributes of each heading tag.



PS: CA

SI : a. 1- H1, 2-H4, 3-H6

b. Align

c. H1 Align = "left", H4 Align = "center" H6 Align = "right"

20. *LO: 4.10*                      *Type: Objective*                      *Score: 2*

Name the tag used to achieve the following:

- To make a sentence in bold face.
- To make font size bigger.
- To underline a sentence.
- to center the contents in a webpage.

PS: CA

SI: <B>, <BIG>, <U>, <CENTER>

21. *LO: 4. 10*                      *Type: Objective*                      *Score: 2*

<STRIKE> tag displays the text in strike through style. It can be substituted with \_\_\_\_\_ tag to get the same result.

PS: CA

SI : <S>

22. *LO: 4.11*                      *Type: Short answer*                      *Score: 3*

We often use quotation. HTML has two ways to represent quotations. Name the tags used for quotations. Explain the difference between these two tags?

PS: CA and CG

SI : <BLOCKQUOTE> and <Q> tags. <Q> tag encloses text in quotation with an indent. This tag is used for short quotations, whereas long quotations use <BLOCKQUOTE> tag.

23. *LO: 4.13*                      *Type: Objective*                      *Score: 4*

Tom wants to display a scrolling text in the web page with the following condition:

- Text height should be 10% of the window.
- It should scroll in the right direction.

- c. There should be a gap of 10 seconds between each scroll of the text.
- d. It should scroll continuously.

Name the HTML tag, its attributes and values used to achieve the above conditions.

PS: CA

SI: <MARQUEE>, Attributes Height= "10%", Direction=" right", Scrollldelay = 10 Loop = INFINITE.

#### Assessment Worksheet 4.1

1. Say true or false:  
" <HTML>, <html>, <HtmL>, <HtmL> etc. have the same meaning"
2. Pick the odd one out:  
<BR>, <HR>, <IMG>, <HEAD>
3. Identify tag, attribute, value from the code <HTML Lang = "E1">.
4. <IMG> is a/an \_\_\_\_\_ tag ( container/empty).
5. The closing tag is similar to opening tag, but has an additional character after the first angle bracket. Name the character.

#### Assessment Worksheet 4.2

1. Name the tag which indicates to the browser that the enclosed text is preformatted and should not be reformatted again.
2. Predict the output of H<SUB>2 </SUB>SO<SUB>4</SUB>
3. Say true or false:  
The effect of using <EM> tag is the same as that of <I> tag.
4. What is the use of <ADDRESS> tag?
5. Give any two attributes of <HR> tag.

# 5

## Web Designing using HTML

### Introduction

In the previous chapter, students are introduced to the basic tags of HTML. In this chapter we are continuing from the basic and introducing advanced features in HTML. Lists and their types are introduced first. Then creating Tables, Frames, and Forms are introduced one by one. Each of the concepts is discussed with their corresponding tags and their important attributes.

Teachers should try to demonstrate concepts with maximum sample codes. The learners should get a concrete idea on the subject, so that in the following chapters, where learners are introduced to advanced web technologies, they should feel at ease with HTML. Lab works are to be supplemented wherever necessary.

### Values and Attitudes

- ✓ Sharing and caring through collaboration and co-operation.
- ✓ Motivation to create web pages and to become part of a large world community.
- ✓ Inspired to access information with ease from anywhere.

## Unit Frame

Periods: 20

| Concept/Idea and Process skills   | Process/Activities with Assessments  | Learning outcomes   |
|---|--|---|
| Lists in HTML<br>✓ Understanding<br>✓ Identifying<br>✓ Classifying<br>✓ Comparing<br>✓ Charting | General discussion on different types of lists found in real life.<br><b>Assessment:</b><br>➤ Program code<br>➤ Preparation of notes<br>➤ Lab work<br>➤ Worksheet 5.1  | 1. Distinguishes various types of lists available in HTML     |
| Linking the web pages<br>✓ Understanding<br>✓ Observing   | General discussion by demonstrating the internal and external linking.<br><b>Assessment:</b><br>➤ Program code<br>➤ Lab work   | 2. Links various web pages and sections within a webpage      |
| Embedding audio and video in web pages<br>✓ Analyzing<br>✓ Communicating<br>✓ Understanding     | Slide presentation and discussion on embedding multimedia<br><b>Assessment:</b><br>➤ Program code  | 3. Embeds various audio, and video files in a web page        |
| Producing inline sounds and video in web page<br>✓ Identifying<br>✓ Presenting                  | Discussion and demonstration of inline sound and video.<br><b>Assessment:</b><br>➤ Program code<br>➤ Lab work  | 4. Embeds inline audio video                                  |
| Tags and attributes of TABLE<br>✓ Observing<br>✓ Identifying<br>✓ Communicating                 | General discussion on the use of tables in presenting data, and on tags, and attributes of tables.<br><b>Assessment:</b><br>➤ Preparation of notes.<br>➤ Worksheet 5.2 | 5. Lists various tags and attributes in creating a table      |
| Associated tags of TABLE tag<br>✓ Comparing<br>✓ Communicating<br>✓ Inferring                   | General discussion and comparison on different tags used in creating TABLE<br><b>Assessment:</b><br>➤ Program code   | 6. Compares tags such as TD, TH and their attributes and uses |

| Concepts/Ideas and Process skills  | Process/Activities with Assessments   | Learning outcomes   |
|--|---|---|
| Construction of TABLES using tags<br><ul style="list-style-type: none"> <li>✓ Observing</li> <li>✓ Predicting</li> </ul>                     | Demonstration of TABLE creation.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Program code</li> <li>➤ Output prediction</li> <li>➤ Error correction</li> </ul>                            | 8. Illustrates the creation of Table                          |
| FRAMES in HTML<br><ul style="list-style-type: none"> <li>✓ Observing</li> <li>✓ Identifying</li> </ul>                                       | Slide presentation on creating FRAMES and FRAMESETS.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Program code</li> <li>➤ Error correction</li> <li>➤ Assessment Worksheet 5.3</li> </ul> | 9. Illustrates the use of frames and framesets.               |
| Creating frames using appropriate tags<br><ul style="list-style-type: none"> <li>✓ Observing</li> <li>✓ Identifying</li> </ul>               | Discussion on the tags and attributes of FRAMES.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Program code</li> </ul>   | 10. Creates frames  |
| FORMS in web page<br><ul style="list-style-type: none"> <li>✓ Observing</li> <li>✓ Identifying</li> <li>✓ Communicating</li> </ul>           | General discussion on the use of FORM.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Activity log</li> <li>➤ Note preparation</li> </ul>   | 11. Explains the use of forms in HTML.                        |
| Various components in FORMS<br><ul style="list-style-type: none"> <li>✓ Identifying</li> <li>✓ Charting</li> <li>✓ Applying</li> </ul>       | Discussion on various components in Form with the help of slide presentation.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Activity log</li> </ul>  | 12. Lists the use of forms in html and its components.        |
| Design of web pages with the above discussed features<br><ul style="list-style-type: none"> <li>✓ Identifying</li> <li>✓ Applying</li> </ul> | Demonstration of web page designing.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Program code</li> </ul>   | 13. Creates a web page with all the features discussed so far |

**Process Assessment**

- Group discussions,
- Demonstration of various tags and attributes.
- Lab work.

**Portfolio Assessment**

- Activity log book
- Assessment worksheets
- Practical Log Book

**Unit Assessment**

- Class test

**Towards the Unit:****Creation of TABLE**

(1 Period)

***Suggested activities: Demonstration and discussion***

- Teacher shows a table with appropriate data on the black board/ using projector. While selecting the table, try to include a table with rowspan and/or colspan features.
  - o Start HTML coding.
  - o Show its effect simultaneously on any browser.
  - o Ask suggestion from randomly selected students on the next tags and attributes.
  - o Show the difference in the table when each new tag is introduced.
  - o Show the final table and conclude by explaining the result.
  - o Ask each student to draw a table and attempt to write the code for the same.

**Various components in FORMS**

(1 period)

***Suggested activities: Slide presentation and discussion***

- Teacher asks the students how they came to know their SSLC result.
  - o Students respond that they used the Internet.

- o Teacher asks the step-by-step procedure to get the mark list.
  - o Students explain it.
- Teacher introduces the concept of form.
- Once again teacher asks them how they applied for Class XI admission.
  - o Students describe the single window online application process.
  - o Teacher asks a few students about the different types of data they entered.
  - o Students name a few.
  - o Teacher identifies this with various components available in FORM.
- Teacher consolidates the discussion leading to different components of form with the help of slide presentation which shows various components in FORMs.

### TE Questions

1. LO 5.1 *Type : Essay* *Score: 5*

Write an HTML code for creating the following web page XYZ PVT LTD, New Delhi.

1. Health care
  - Shampoo
  - Hair oil
2. Baby products
  - a. Baby soap
  - b. Dress
  - c. Toys
3. Men's wear
  - Casuals
  - Formals

PS: CG

SI : Code for the web page



2. LO 5.2 Type : Objective Score: 1

\_\_\_\_\_ tag provides hyperlinks in HTML.

PS: CA

SI : <A>

3. LO 5.3 Type : Objective Score: 1

Attribute of <EMBED> tag which specifies the URL of the audio or video files to be included is \_\_\_\_\_.

- a. Noembed      b. Src      c. Alt      d. Main

PS: CA

SI : Src

4. LO 5.4 Type : Objective Score: 1

\_\_\_\_\_ tag helps in playing audio in the background while a page is viewed.

PS: CA

SI : <BGSOUND>

5. LO 5.5 Type : Objective Score: 1

Adil wants to change the thickness of the border line of a table in his web page. Which attribute of <TABLE> tag can be used for this?

PS: CA

SI : Border

6. LO 5.6 Type : Short answer Score: 3

Write the HTML code to create the following table.

| SUBJECT |           | MARK |
|---------|-----------|------|
| SCIENCE | Maths     | 45   |
|         | Chemistry | 42   |

PS: CG

SI : Correct tags and attributes

7. LO 5.8 Type : Short answer Score: 3

Shabilesh is creating a web page. Help him to write the HTML code to divide the window horizontally in the ratio 35: 65.

PS : CG

SI : Write code for creating frameset

8. *LO 5.11*                      *Type : Short answer*    *Score: 3*

Write HTML code to create the following:

|          |                      |                                       |
|----------|----------------------|---------------------------------------|
| User ID  | <input type="text"/> | <input type="button" value="Submit"/> |
| Password | <input type="text"/> |                                       |
| District | <input type="text"/> | <input type="button" value="Reset"/>  |

PS: CG

SI : Code

9. *LO 5.7*                                      *Type : Essay*    *Score: 6*

Write HTML code to create the following table.

| No. of Students |                  |          |
|-----------------|------------------|----------|
| Science         |                  | Commerce |
| Biology         | Computer Science |          |
| 56              | 57               | 60       |

PS : CG

SI : Correct code

10. *LO 5.6*                                      *Type : Essay*    *Score: 3*

Predict the output

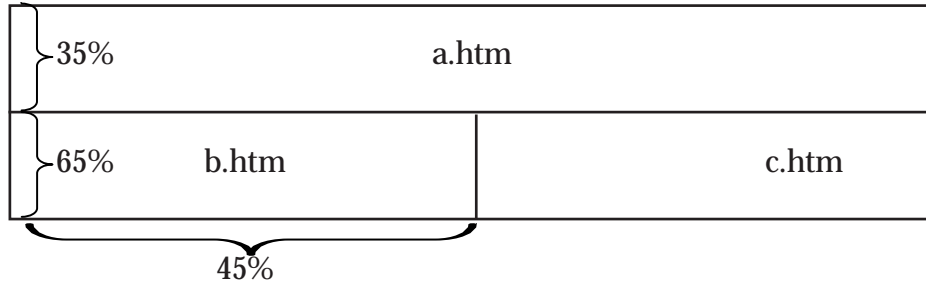
```
<TABLE>
  <TR>
    <TH>1</TH>
    <TH>2</TH>
  </TR>
  <TR>
    <TD>3</TD>
    <TD>4</TD>
  </TR>
  <TR>
    <TD>6</TD>
    <TD>7</TD>
  </TR>
</TABLE>
```

PS: CG

SI : Correct output.

11. LO 5.9 Type : Short answer Score: 4

Write the code to divide a browser window into three parts as follows.



PS: CG

SI : HTML code for frameset

12. LO 5.11 Type : Short answer Score: 4

Name two Form submission methods. Compare the two methods.

PS: CA

SI : Post and Get

13. LO 5.9 Type : Short answer Score: 2

Match the following:

|          |             |
|----------|-------------|
| Frame    | Cellspacing |
| Table    | Rows        |
| TR       | Align       |
| Frameset | Src         |

PS: CA

SI : correct match ½ mark each

14. LO 5.3 Type : Short answer Score: 1

What is the use of <EMBED> Tag?

PS: CA

SI : To include audio-video files.

15. LO 5.2                      *Type : Short answer*    *Score: 6*

What are the different types of links available in HTML? Explain in detail.

PS: CA

SI : Three types, ordered, unordered, definition lists

16. LO 5.10                      *Type : Short answer*    *Score: 2*

Write HTML code for including options to select gender (Male or Female). How do you mark one of the items in the select list as default?

PS: CG

SI : input type radio, value

## Project

### **A simple website for your school**

Now you are familiar with HTML. You can try to create a website for your school. It should contain at least 5 web pages including home page. Home page should give details regarding school and links to all other pages. Each and every page should have link back to the home page and if necessary to other pages and sections.

The other pages should include one for academic details. Another web page for sports and games and one for extracurricular activities. Another page should be there for announcement and notice such as scholarships for students.

Make sure that each web page is made attractive with necessary features including multimedia, frames, forms, tables etc.

**Assessment Worksheet 5.1**

1. Unordered lists are also called \_\_\_\_\_.
2. What is the default value of `Type` attribute?
3. How can we start an ordered list which starts numbering from 9?
4. What is the difference between `Start` and `Type` attribute?
5. `<DD>` and `<DT>` tags are used for.
  - a) Unordered list b) Sorted list c) Ordered list d) Definition list

**Assessment Worksheet 5.2**

1. What is the full form of URL?
2. \_\_\_\_\_ tag is used for creating links.
3. The main attribute of `<A>` tag is \_\_\_\_\_.
4. A link to another section of the same webpage is called \_\_\_\_\_.
5. Say true or false.  
We can give hyperlinks to images.

**Assessment Worksheet 5.3**

1. In HTML, \_\_\_\_\_ is used to divide a window into two or more different sections.
2. Pick the odd one out.
  - a) Start      b) Rows      c) Border      d) Cols
3. Say true or false.  
Frameset is an empty tag.
4. Give any three attributes of Frame tag.
5. What is the use of `<NOFRAME>` tag?

# 6

## Client Side Scripting using Javascript

### Introduction

This chapter introduces JavaScript as the client-side scripting language. JavaScript is the most popular scripting language used at the client side. We can hardly find a web page that does not use JavaScript. Scripting language is the only way to include program element in a web page. While introducing this chapter in the class, ensure that the learners are clear about the importance and use of scripting language in a web page. One of the advantages of teaching JavaScript is that its syntax is very much similar to C++. Hence it is not difficult to transact the content of this chapter. Most of the sections in this chapter can be considered as a revision of C++ chapters. We don't need to use any special software to use JavaScript in a web page. We can use any text editor to create a web page containing JavaScript. In the previous chapters we have used the editor Geany to create web pages. Hence, we can use the same editor, Geany, to learn JavaScript also. JavaScript provides a large number of built-in functions for the programmers. Some of the JavaScript functions use mixed cases in their name (for example `toUpperCase()`). Since JavaScript is case sensitive, we must be careful in using proper cases for the function names. If we use Geany as the editor, it will display the keywords in blue colour. i.e. if we use the correct name for a function, it will be displayed in blue color. This will help us to identify, whether the entered function name is correct or not. For the effective transaction of the content in this chapter, the teacher may use the demonstration method. The children must be given enough lab hours to practice the concept learned in this chapter.

### Values and Attitudes

- ✓ Appreciates the facilities provided by the JavaScript to create web pages.
- ✓ Develops the quality of systematic arrangements.
- ✓ Enhances logical reasoning.

### Unit Frame

Periods: 25

| Concepts/Ideas and Process skills   | Process/Activities with Assessments   | Learning outcomes   |
|---|---|---|
| Client side and server side scripting language<br>✓ Observing<br>✓ Identifying<br>✓ Understanding                   | Demonstration and Discussion<br><b>Assessment:</b><br>➤ Worksheet<br>➤ Preparation of notes               | 1. Distinguishes the use of client side and sever side scripting language.        |
| The importance of using client side scripting language<br>✓ Observing<br>✓ Identifying<br>✓ Understanding           | Demonstration and Discussion<br><b>Assessment:</b><br>➤ Worksheet<br>➤ Preparation of notes               | 2. Explains the need of client side scripting language.                           |
| Importance of JavaScript as the client side scripting language<br>✓ Observing<br>✓ Identifying<br>✓ Understanding   | Demonstration and Discussion<br><b>Assessment:</b><br>➤ Worksheet<br>➤ Preparation of notes               | 3. Identifies the importance of JavaScript as the client side scripting language. |
| Creating user-defined functions in JavaScript<br>✓ Observing<br>✓ Identifying<br>✓ Understanding<br>✓ Experimenting | Demonstration and Discussion<br><b>Assessment:</b><br>➤ Worksheet<br>➤ Preparation of notes<br>➤ Lab work | 4. Uses JavaScript functions in a web page.                                       |
| Data types in JavaScript<br>✓ Observing<br>✓ Identifying<br>✓ Understanding   | Demonstration and Discussion<br><b>Assessment:</b><br>➤ Worksheet<br>➤ Preparation of notes               | 5. Explains different data types in JavaScript.                                   |
| Use variables in JavaScript<br>✓ Observing<br>✓ Identifying<br>✓ Understanding<br>✓ Experimenting                   | Demonstration and Discussion<br><b>Assessment:</b><br>➤ Worksheet<br>➤ Preparation of notes<br>➤ Lab Work | 6. Uses correct variables in JavaScript.  |

| Concepts/Ideas and Process skills  | Process/Activities with Assessments  | Learning outcomes  |
|--|--|--|
| Control Structures in JavaScript<br><ul style="list-style-type: none"> <li>✓ Observing</li> <li>✓ Identifying</li> <li>✓ Understanding</li> <li>✓ Experimenting</li> </ul>         | Demonstration and Discussion<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Worksheet</li> <li>➤ Preparation of notes</li> <li>➤ Lab Work</li> </ul> | 7. Uses appropriate control structures in program codes.                           |
| Built-in functions in JavaScript<br><ul style="list-style-type: none"> <li>✓ Observing</li> <li>✓ Identifying</li> <li>✓ Understanding</li> <li>✓ Experimenting</li> </ul>         | Demonstration and Discussion<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Worksheet</li> <li>➤ Preparation of notes</li> <li>➤ Lab Work</li> </ul> | 8. Uses appropriate built-in functions in JavaScript.                              |
| Use document elements in JavaScript<br><ul style="list-style-type: none"> <li>✓ Observing</li> <li>✓ Identifying</li> <li>✓ Understanding</li> <li>✓ Experimenting</li> </ul>      | Demonstration and Discussion<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Worksheet</li> <li>➤ Preparation of notes</li> <li>➤ Lab Work</li> </ul> | 9. Explains the method to access document elements using JavaScript.               |
| Use text box and combo box in JavaScript<br><ul style="list-style-type: none"> <li>✓ Observing</li> <li>✓ Identifying</li> <li>✓ Understanding</li> <li>✓ Experimenting</li> </ul> | Demonstration and Discussion<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Worksheet</li> <li>➤ Preparation of notes</li> <li>➤ Lab Work</li> </ul> | 10. Creates JavaScript functions that handle values in text boxes and combo boxes. |

### Process Assessment

- Involvement in the discussions.
- Lab work.

### Portfolio Assessment

- Activity log book, Practical log book.
- HTML documents prepared in the lab.
- Assessment worksheets.

### Unit based Assessment

- Class test.
- Quiz on various data types and built-in functions in JavaScript.



## Towards the Unit:

### The need of scripting language

(1 Period)

#### *Suggested activity: Demonstration and discussion*

The teacher opens a web page containing username and password entry as shown in the following figure.



The teacher initiates the discussion among the students by asking the following questions.

You must have seen various websites for accepting userName and password as shown in the above page. What will happen to those pages, if you click the login button without entering the userName or password?

The teacher collects various responses. The responses can be concluded as "the web page displays a message telling the user to enter the username or password, whichever is missing in the page".

Now, the teacher can ask another question: How do we make this possible in the above web page? The teacher can open the code of the above web page as shown below.

Tell the students to make necessary modifications in the above code. Let the children think and discuss among themselves. Finally they will reach a conclusion that it is not possible for them to achieve the same using the knowledge gained so far.

```

1 <html>
2 <head>
3 <title>LOGIN PAGE</title>
4 </head>
5 <body leftmargin="20" topmargin="50">
6 <form name="myform">
7   User Name <input type="text" name="txtName"> <br><br>
8   Password <input type="password" name="txtPassword"> <br><br>
9   <input type="submit" value="Login" onclick="checkData()">
10 </form>
11 </body>
12 </html>
13
14

```

The teacher can modify the above program code as shown below and open the web page in a browser. Let children observe that the web page displays a message directing the user to enter user name if it is not given. Even though children won't understand the meaning of the code entered in the HTML file, first of all, let them understand that it is possible to

achieve it with a few lines of program code. Tell them that they will learn each and every minute detail of the HTML code in a short while.

Tell the students to observe the newly added portion in the above code.

Let them note down and discuss the familiar items in the program code. The teacher can consolidate that most of the items in the newly added code is the same as in C++.

```
<HTML>
<HEAD>
  <TITLE>LOGIN PAGE</TITLE>
  <SCRIPT language = 'JavaScript'>
    function checkData()
    {
      var x;
      x = document.myForm.txtName.value;
      if (x == "")
      {
        window.alert("Please enter username ....");
      }
    }
  </SCRIPT>
</HEAD>
<BODY leftmargin="50" topmargin="50">
  <form name="myForm">
    User Name <input type="text" name="txtName"> <br><br>
    Password <INPUT type = 'password' name="txtPassword"> <br><br>
    <INFUT type = 'submit' value = 'Login' onclick="checkData()">
  </form>
</BODY>
</HTML>
```

## TE Questions

1. *L.O : 6.1. Type : Objective Score : 1*

In the client side, a web designer can use either JavaScript or VBScript as the scripting language. Name the attribute of <SCRIPT> tag that can be used to specify the language.

SI : Language

PS: CA

2. *L.O : 6.4. Type : Objective & Short answer Score : 3*

Can you use <SCRIPT> tag in a web page without using "language" attribute? Justify your answer.

SI : Yes.

If the language attribute is not used, the browser will consider JavaScript as the default value for this attribute.

PS: CA

3. *L.O : 6.4. Type : Short answer Score : 3*

Scripts can be embedded in HEAD section or BODY section of an HTML page. What difference do you feel in placing a script in these two sections?

PS: CA

SI : If the script is in the HEAD section, all the scripts will be loaded before the BODY section. Hence if a large volume of scripts are there in a web page, the page will be loaded slowly. But, if the script is placed in bottom of the BODY section, the script is loaded only after displaying all the page content in the browser window. Hence the user will feel that the page is loaded faster than in the previous case.

But, if the script is in the bottom of the BODY section and if the web page calls any script function on loading of the BODY section, the function will not work properly.

4. *L.O : 6.4. Type : Objective Score : 2*

State true or false.

- Using script is the only way to include programming elements in an HTML page.
- It is always necessary to use language attribute in a <SCRIPT> tag.
- A script can be placed only in the HEAD section of an HTML page.
- <SCRIPT> tag is an empty tag.

SI: a) Yes.    b) No.    c) No.    d) No.    PS: CA

5. *L.O : 6.3. Type : Objective Score : 1*

The browser uses \_\_\_\_\_ to execute the JavaScript code.

SI : JavaScript Engine    PS: CA

6. *L.O : 6.4. Type : Objective Score : 1*

Like C++, \_\_\_\_\_ is used to denote the end of a JavaScript statement.

SI : Semicolon (;)    PS: CA

7. *L.O : 6.8. Type : Short answer Score : 2*

Write the JavaScript statement to show the message, "This is JavaScript", on the screen in a separate window.

SI : alert("This is JavaScript");    PS: CG

8. *L.O : 6.4. Type : Short answer Score : 2*

A web developer included the following code in his web page.

```
<HTML>
  <HEAD>
    <SCRIPT>
      function show()
      { document.write("This is a function.");
      }
    </SCRIPT>
```

```

</HEAD>
<BODY>
    show();
</BODY>
</HTML>

```

What will be the output of the above web page? PS: CA

SI : The above page will show "This is a function." on the web page.

9. L.O : 6.4. Type : Objective Score : 1

\_\_\_\_\_ keyword is used to define functions in JavaScript.

SI : function PS: CA

10. L.O : 6.8. Type : Objective Score : 1

Which are the three basic data types in JavaScript?

SI : number, string, boolean PS: CA

11. L.O : 6.5. Type : Objective Score : 4

Classify the following data items in JavaScript. Give proper heading for each category.

false, 1.38, "true", 300, "welcome", 0.009, "function", 22, true, 0

SI : number : 1.38, 300, 0.009, 22,0

string : "true", "welcome", "function"

boolean : false, true PS: CG

12. L.O : 6.6. Type : Objective Score : 1

The keyword \_\_\_\_\_ is used to define any type of variable in JavaScript.

SI : var PS: CA

13. L.O : 6.4. Type : Short answer Score : 2

Following is a JavaScript function.

```

function show()
{ var x, y, z;
x = 10;

```

```

y = 20;
z = x > y;
window.alert(z);
}

```

What will be the output after executing the above function?

SI : It will show "false" in an alert window.

PS: CA

14. *L.O : 6.6. Type : Short answer Score : 2*

Following is a code segment in JavaScript.

```

var m, n, sum;
m = "100";
n = "50";
sum = m + n;

```

On executing the above code, what will be the value of the variable sum? What modification can be made in the last line to get the value of the variable sum as 150?

SI : 10050

PS: CG

To get 150, the last statement can be modified as

```
sum = Number(m) + Number(n);
```

15. *L.O : 6.7. Type : Short answer Score : 4*

Following is an HTML page that contains a JavaScript code.

```

<HTML>
<BODY>
  <SCRIPT language = "JavaScript">
    var n, i, s = 0;
    for(i =1; i <= 10; i+=2)
    {
      s += i;
    }
    document.write(s);
  </SCRIPT>
</BODY>
</HTML>

```

- a) What will be the output of the above web page?
- b) What will happen if the statement `document.write(s);` is replaced by the statement `window.alert(s);`?

SI : a) The above page will display sum of odd numbers 1, 3, 5, 7 and 9 (i.e. 25) on the web page.

- b) If `window.alert(s)` is used, it will display the result in a separate alert window. Otherwise, the result will be displayed on the web page itself.

PS: CA

16. *L.O : 6.5 & 6.8. Type : Objective Score : 3*

Write the value of the variable z in each of the following cases?

- a) `x = 50;`  
`y = 7;`  
`z = x % y;`
- b) `x = "100";`  
`y = "200";`  
`z = x + y;`
- c) `z = isNaN("3.14");`
- d) `z = toLowerCase("Welcome");`
- e) `x = "Kerala";`  
`z = x.charAt(2);`
- f) `x = "Kerala";`  
`z = x.length;`

SI: a) 1

- b) "100200"
- c) True
- d) "welcome"
- e) "r"
- f) 6

PS: CA

17. *L.O : 6.9. Type : Objective Score : 2*

The following web page shows a button on the web page. Fill in the blank so that the page will display a "Welcome..." message when the mouse is moved over the button.

```

<HTML>
<HEAD>
  <SCRIPT>
    function fun1()
    {      window.alert("Welcome...");
    }
  </SCRIPT>
</HEAD>
<BODY>
  <INPUT type = "submit" .....>
</BODY>
</HTML>
SI : onMouseEnter = "fun1()"
PS: CA

```

18. *L.O : 6.10. Type : Short answer Score : 3*

List the advantages of using external JavaScript file.

SI : Any three valid points. PS: CA

19. *L.O : 6.10. Type : Objective Score : 1*

\_\_\_\_\_ is the extension of JavaScript file when it is saved as an external JavaScript file.

SI : ".js" PS: CA

### Assessment Worksheet 6.1

1. State true or false

- Scripts allow the web developers to embed a piece of program code in the web pages.
- Scripts are used only at the client-side.
- JavaScript is the only Scripting Language used at the client side.
- JavaScript is supported by almost all web browsers in the world.

2. \_\_\_\_\_ tag is used to include scripts in an HTML page.

3. \_\_\_\_\_ is the attribute of <SCRIPT> tag to specify the language.

### Introduction

In the last two chapters students studied in detail how to create web pages. By now they can create a simple website. In this chapter they are introduced to the concepts of web server and webhosting. Starting with the different types of webhosting, learners are guided through the process of hosting a site. How to buy a web hosting space, how to register a domain and what the importance of FTP client software are etc. are also discussed.

Since students are new to the field of webhosting, they are introduced to the free hosting facilities available. CMS (Content Management System) tools, which makes designing and maintaining web pages a simple task is also discussed. Most of the students are familiar with mobile phones and devices like tablet, PC, palmtop, etc. Designing web pages for such devices with diverse screen size and resolution is also stressed.

This chapter should provide an encouragement for every student to tryout something with web hosting. It should give a strong foundation for the learner to move to more sophisticated web tools. Necessary demonstration and hands-on session may be given to learners.

### Values and Attitudes

- ✓ Motivation to create and host web sites and become a part of large world community.
- ✓ Inspired to access information with ease from anywhere.
- ✓ Give everyone same web content, irrespective of the size and quality of the device they use. Equality is stressed.



## Unit Frame

Periods: 10

| Concepts/Ideas and Process skills   | Process/Activities with Assessments  | Learning outcomes  |
|---|--|--|
| Use of web server and concept of webhosting.<br>✓ Understanding<br>✓ Identifying            | General discussion on web server and web hosting.<br><b>Assessment:</b><br>➤ Preparation of notes  | 1. Describes the use of a web server and the concept of web hosting. |
| Types of web hosting<br>✓ Classifying<br>✓ Comparing  | General discussion.<br><b>Assessment:</b><br>➤ Preparation of notes  | 2. Classifies different types of hosting.                            |
| How to buy a hosting space.<br>✓ Analyzing<br>✓ Understanding                               | Demonstration with the help of Internet.<br><b>Assessment:</b><br>➤ Worksheet 7.1  | 3. Explains the ways to buy hosting space.                           |
| Domain registration and hosting using FTP client software.<br>✓ Identifying<br>✓ Presenting | Demonstration and general discussion.<br><b>Assessment:</b><br>➤ Notes preparation<br>➤ Lab work   | 4. Registers a domain and hosts a website using FTP client software. |
| Free hosting<br>✓ Observing<br>✓ Comparing<br>✓ Communicating                               | Demonstration of free hosting service providers with the help of Internet connection and projector.<br><b>Assessment:</b><br>➤ Note preparation. | 5. Explains the features of free hosting.                            |
| Content Management System<br>✓ Comparing<br>✓ Inferring                                     | General discussion and comparison on Content Management System<br><b>Assessment:</b><br>➤ Class quiz   | 6. Identifies the use of Content Management System.                  |
| Responsive web design.<br>✓ Observing<br>✓ Predicting                                       | Demonstration of a responsive webpage on various types of devices.<br><b>Assessment:</b><br>➤ Worksheet 7.2<br>➤ Notes preparation               | 7. Describes the need for responsive web design.                     |

**Process Assessment**

- Involvement in the discussions.

**Portfolio Assessment**

- Activity log book.
- Assessment worksheets.

**Unit based Assessment**

- Class test.

**Towards the Unit:****Responsive web design****(1 Period)*****Suggested activities: Demonstration and discussion***

- Demonstration of a responsive web page on various types of devices.
- Teacher asks the students to name a few devices which can be used to access internet.
  - o From a typical class room, students will come up with various names including smart phones, laptop, desktop and even smart TV.
  - o Teacher shows them a few devices like laptop, smart phone, tablet PC etc.
- Teacher connects these devices to the Internet.
- Once it is connected, teacher opens a non-responsive website and shows it in three devices simultaneously.
  - o Students notice the difference.
  - o Teacher explains the concept and further elaborates the difficulty in showing a conventional page (non responsive) in different devices with different sizes.
  - o Then introduces the concept of responsive web page as a solution to this problem.
- Teacher consolidates the discussion by showing a responsive website in all these devices simultaneously. Students notice the differences and notes are prepared.

## TE Questions

1. *LO 7.1*                      *Type : Objective*                      *Score : 1*  
       \_\_\_\_\_ is the service of providing storage space in a web server to serve files for a website to be made available on the Internet.  
       PS: CG  
       SI : Web hosting
2. *LO 7.2*                      *Type : Short answer*                      *Score : 3*  
       Mr. Mohan wants to host a personal website with minimal cost. Which type of web hosting would you advise for him? Justify your answer.  
       PS: CA  
       SI : Shared hosting
3. *LO 7.3*                      *Type : Short answer*                      *Score : 3*  
       The principal asked the Computer Science teacher to create a website for the school immediately. Can you assist the teacher in taking decision on buying hosting spaces. What are the factors to be considered while buying hosting space?  
       PS: CA  
       SI : For specifying the factors.
4. *LO 7.2*                      *Type : Short answer*                      *Score : 2*  
       Choose the odd one out, and justify your answer.  
       a) Shared hosting  
       b) Dedicated hosting  
       c) DNS  
       d) Virtual Private Server  
       PS: CA  
       SI : DNS, all others are types of web hosting.
5. *LO 7.2*                      *Type : Essay*                      *Score : 5*  
       Explain different types of web hosting?  
       PS: CA  
       SI : shared hosting, dedicated hosting, virtual private server

6. *LO 7.4*                      *Type : Short answer*    *Score : 2*  
What is 'A record'?  
PS: CA  
SI : Definition of the term
7. *LO 7.4*                      *Type : Short answer*    *Score : 2*  
What is the use of FTP client software?  
PS: CA  
SI : Transfer of files from our computer to web server
8. *LO 7.5*                      *Type : Short answer*    *Score : 3*  
Haseena has decided to host her new website using free hosting facility; her friend Rinisha is against this move. Can you guess her argument against the utilization of free hosting facility?  
PS: CG  
SI : Limitations of free web hosting.
9. *LO 7.6*                      *Type : Objective*    *Score : 1*  
Joomla is an example for  
a) CMS  
b) ISP  
c) DNS  
d) None of the above  
PS: CG  
SI : CMS.
10. *LO 7.7*                      *Type : Essay*    *Score : 5*  
What is responsive web design? Why is it gaining importance recently?  
PS: CG  
SI : definition, many devices with different sizes are used in accessing Internet.

**Assessment Worksheet 7.1**

1. Define web hosting.
2. Name any two types of web hosting.
3. ICANN has database which contains a list of all \_\_\_\_\_.
4. 'A record' stands for \_\_\_\_\_.
5. Dedicated hosting
  - a) shares server with other websites.
  - b) is usually inexpensive.
  - c) does not guarantee performance.
  - d) offers freedom for the clients to choose the hardware and the software.

**Assessment Worksheet 7.2**

1. SFTP uses \_\_\_\_\_ protocol which provides secure file transfer facility.
2. CMS stands for \_\_\_\_\_.
3. Give any two examples of CMS.
4. What is responsive web design?
5. \_\_\_\_\_ web design helps in viewing web pages in different devices comfortably.

### Introduction

This unit introduces learners to the concept of an effective record keeping system, database management system (DBMS). The limitations of conventional file systems and advantages of DBMS are also discussed. At this stage, learner identifies the pros and cons of normal file systems, and recognizes the various advantages of using the DBMS. This unit explores the concept of data abstraction and data independence. In the next stage, the learners are familiarized with main terminologies in relational database management system. This unit also discusses relational algebra and its operations. From this unit the learners should get a concrete idea about the concept of DBMS, relational algebra and various operations on relational algebra. The teacher should provide learners with maximum queries to create a solid idea on relational algebra.

#### Values and Attitudes

- ✓ Ability to use most efficient data storage mechanism.
- ✓ Sharing and caring through collaboration and co-operation.
- ✓ Approach a problem positively and arrive at solutions through logical thinking.

## Unit Frame

Periods: 15

| Concepts/Ideas and Process skills  | Process/Activities with Assessments   | Learning outcomes   |
|--|---|---|
| Need of database.<br>✓ Communicating<br>✓ Identifying                                  | General discussion on files in computer.<br><i>Assessment:</i><br>➤ Activity log                                    | 1. Recognizes the need for files.   |
| Concept of database.<br>✓ Communicating<br>✓ Identifying                               | Group discussion on the limitations of conventional file systems.<br><i>Assessment:</i><br>➤ Activity log           | 2. Identifies the major limitations of the conventional file management system.   |
| Advantages of DBMS.<br>✓ Communicating<br>✓ Identifying<br>✓ Comparing                 | General discussion on various merits of DBMS.<br><i>Assessment:</i><br>➤ Activity log                               | 3. Lists and explains the different advantages of the database management system. |
| Components of the DBMS environment.<br>✓ Communicating<br>✓ Identifying<br>✓ Comparing | General discussion on various components of the DBMS and their purpose.<br><i>Assessment:</i><br>➤ Activity log     | 4. Lists the various components of the DBMS and explains their purpose.           |
| Users of database.<br>✓ Communicating<br>✓ Identifying<br>✓ Comparing                  | General discussion on different types of users and their roles in the DBMS.<br><i>Assessment:</i><br>➤ Activity log | 5. Recognizes the types of users and their roles in the DBMS environment.         |
| Data abstraction and Data independence.<br>✓ Communicating<br>✓ Identifying            | Discussion on levels of data abstraction and data independence in DBMS.<br><i>Assessment:</i><br>➤ Activity log     | 6. Explains the levels of data abstraction and data independence in DBMS.         |
| Relational data model.<br>✓ Communicating<br>✓ Identifying                             | Discussion on the relational model.<br><i>Assessment:</i><br>➤ Activity log   | 7. Explains the relational model by citing examples.                              |
| Terminologies in RDBMS.<br>✓ Communicating<br>✓ Identifying<br>✓ Observing             | Discussion on the various terminologies in RDBMS.<br><i>Assessment:</i><br>➤ Activity log                           | 8. Uses the different terminologies in RDBMS appropriately.                       |

| Concepts/Ideas and Process skills  | Process/Activities with Assessments  | Learning outcomes  |
|--|--|--|
| Relational Algebra.<br>✓ Communicating<br>✓ Identifying<br>✓ Applying<br>✓ Problem solving | Discussion on the various operations in relational algebra. Prepare relational algebra query.<br><b>Assessment:</b><br>➤ Activity log<br>➤ Predicted output of relational algebraic expressions.<br>➤ Assignment | 9. Applies and evaluates the various operations in relational algebra. |

### Process Assessment

General discussions, Activity Log preparation.

### Portfolio Assessment

Activity Log

### Unit-wise Assessment

- Written test can be conducted using the questions given in the 'Know your Progress' section and sample questions provided in the text book.
- Surprise test can be conducted using the questions in relational algebra.

### Towards the Unit:

### Introduction to Relational Data Model

(1 Period)

**Suggested activities:** General discussion on database and RDBMS using real life examples and preparation of notes.

Teacher initiates a general discussion on the importance of RDBMS.

- Students are asked individually to identify real life situations where the concept of RDBMS is applied. The following examples may be given as clues:
  1. School admission register, school library register etc.
  2. A document containing the name, age and place of the students in a class.



Teacher poses questions like 'How are data written in the register?' or 'How do we write the details of students in a sheet of paper?'.

- Responses are invited randomly and consolidation is made as follows:
  - o Data in registers is written row-wise and column-wise, some type of databases also store data in this manner.
  - o Database that stores data in rows and columns is called relational database management system.
  - o Introduces table, rows, columns etc.
- The teacher ensures that the consolidation points are written in the Activity Log.

### TE Questions

1. *LO: 8.6*                      *Type : Objective*    *Scores: 1*

Choose the correct database level that is closest to the storage device.

- |             |               |
|-------------|---------------|
| a. External | b. Logical    |
| c. Physical | d. Conceptual |

PS: CA

SI: c. Physical

2. *LO: 8.3*                      *Type : Objective*    *Scores : 3*

A bank chose a database system instead of simply storing data in conventional files. What are the merits expected by the bank?

PS: CA

SI: Advantages of DBMS

3. *LO: 8.8*                      *Type : Objective*    *Scores : 1*

In the relational model, degree is termed as \_\_\_\_\_.

- |                      |                           |
|----------------------|---------------------------|
| a. Number of tuples. | b. Number of attributes.  |
| c. Number of tables. | d. Number of constraints. |

PS: CA

SI: b. Number of attributes

4. *LO: 8.6*                      *Type : Objective*    *Scores : 1*

Abstraction of the database can be viewed in \_\_\_\_\_ levels.

PS: CA

SI: 3

5. *LO: 8.8*                      *Type : Short answer*    *Scores : 3*

A table with three columns is given below. Find the best match for the items in column A from those given in column B and column C.

| Column A         | Column B       | Column C   |
|------------------|----------------|------------|
| Rows             | Degree         | Storage    |
| Column           | Physical level | Tuples     |
| Data abstraction | Cardinality    | Attributes |

PS: CG

SI: Rows - Cardinality - Tuples

Column - Degree - Attributes

Data abstraction - Physical level - Storage

6. *LO: 8.9*                      *Type : Objective*    *Scores : 1*

A file manipulation command that extracts some of the columns from a file is called \_\_\_\_\_.

- a. SELECT    b. PROJECT  
c. UNION    d. INTERSECTION

PS: CA

SI: b. PROJECT

7. *LO: 8.8*                      *Type : Objective*    *Scores : 1*

An instance of relational schema R (A, B, C) has distinct values of A including NULL values. Which one of the following is true?

- a. A is a candidate key                      b. A is not a candidate key  
c. A is a primary Key                      d. Both (a) and (c)

PS: CG

SI: b. A is not a candidate key

8. *LO: 8.8*                      *Type : Short answer*                      *Scores : 2*  
How many distinct tuples and attributes are there in a relation instance with cardinality 22 and degree 7.  
PS: CG  
SI: Number of tuples 22 and attributes 7.
9. *LO: 8.8*                      *Type : Objective*                      *Scores : 1*  
Which of the following keys does not allow null values?  
a. Primary Key                      b. Candidate key  
c. Both a. and b.                      d. None of these  
PS: CG  
SI: c. Both a and b.
10. *LO: 8.8*                      *Type : Objective*                      *Scores : 1*  
\_\_\_\_\_ model operates at the lowest level of abstraction, describing how the data is saved on storage devices.  
a. External level                      b. Physical level  
c. Conceptual level                      d. View level.  
PS: CA  
SI: b. Physical level
11. *LO: 8.8*                      *Type : Objective*                      *Scores : 1*  
In a relational model, rows are termed as \_\_\_\_\_.  
a. Tuples                      b. Attributes                      c. Tables                      d. Cardinality  
PS: CA  
SI: a. Tuples
12. *LO: 8.8*                      *Type : Short answer*                      *Scores : 2*  
Distinguish between primary key and candidate key?  
PS:  
SI: Write any 2 points.
13. *LO: 8.8*                      *Type : Short answer*                      *Scores : 3*  
Distinguish between primary key and alternate key.  
PS: CA  
SI: Give two points relating to primary key and alternate key.

14. *LO: 8.6* *Type : Short answer* *Scores : 4*  
 Describe the various levels of data abstraction? How are these levels of data abstraction related with data independence?  
 PS: CA  
 SI: Definition of data abstraction and data independence.
15. *LO: 8.3* *Type : Short answer* *Scores : 3*  
 Data sharing is an essential feature of DBMS. How data sharing reduces the data inconsistency in a database?  
 PS: CA  
 SI: Explains data redundancy, data inconsistency and data sharing.
16. *LO: 8.8 and 8.9* *Type : Short answer* *Scores : 2*  
 Cardinality of a table T1 is 10 and of table T2 is 8 and the two relations are union compatible. If the cardinality of result  $T1 \cup T2$  is 13, then what is the cardinality of  $T1 \cap T2$ ? Justify your answer.  
 PS: CG  
 SI: 5, give explanation.
17. *LO: 8.8 and 8.9* *Type : Short answer* *Scores : 3*  
 Cardinality of a table T1 is 10 and of table T2 is 8 and the two relations are union compatible.  
 What will be the maximum possible cardinality of  $T1 \cup T2$  ?  
 What will be the minimum possible cardinality of  $T1 \cup T2$  ?  
 PS: CG  
 SI: maximum cardinality of  $T1 \cup T2$  is 18 and the minimum possible cardinality of  $T1 \cup T2$  is 8.
18. *LO: 8.6* *Type : Short answer* *Scores : 3*  
 How are schema layers related to the concepts of logical and physical data independence?  
 PS: CA  
 SI: Definition of logical and physical data independence

19. *LO: 8.4*                      *Type : Short answer*                                      *Scores : 2*

Lists the various components in DBMS environment.

PS: CA

SI: Give the name of components.

20. *LO: 8.9*                      *Type : Essay*    *Scores : 4*

Consider the instance of the EMPLOYEE relation shown in the following table. Identify the attributes, degree, cardinality and domain of Name and Emp\_Code.

| Emp_Code | Name     | Department | Designation | Salary |
|----------|----------|------------|-------------|--------|
| 1000     | Sudheesh | Purchase   | Clerk       | 15000  |
| 1001     | Dhanya   | Sales      | Manager     | 25000  |
| 1002     | Fathima  | Marketing  | Manager     | 25000  |
| 1003     | Shajan   | Sales      | Clerk       | 13000  |

PS: CA

SI: Attributes-Emp\_Code, Name, Department, Designation, Salary.

Degree - 5, Cardinality - 4, Domain of Name - any valid name.

21. *LO: 8.9*                      *Type : Essay*    *Scores : 6*

Using the instance of the EMPLOYEE relation shown in question 20, write the result of the following relational algebra expressions.

$\sigma_{\text{Department}=\text{"Marketing"}}(\text{EMPLOYEE})$ .

$\sigma_{\text{salary}>10000 \wedge \text{Department}=\text{"Sales"}}(\text{EMPLOYEE})$ .

$\sigma_{\text{salary}>12000 \vee \text{Department}=\text{"Sales"}}(\text{EMPLOYEE})$ .

$\pi_{\text{name, designation}}(\text{EMPLOYEE})$ .

$\pi_{\text{name, department}}(\sigma_{\text{Designation}=\text{"Manager"}}(\text{EMPLOYEE}))$ .

$\pi_{\text{name, Department}}(\sigma_{\text{Designation}=\text{"Clerk"} \wedge \text{salary} > 20000}(\text{EMPLOYEE}))$ .

PS: CG

SI: Draw the resultant table.

22. *LO: 8.2 and 8.3*                      *Type : Essay*                      *Scores : 5*  
Define database management system and explain the various merits and demerits of DBMS.  
PS: CA  
SI: Definition of DBMS, merits and demerits of DBMS.
23. *LO: 8.5*                      *Type : Essay*                      *Scores : 5*  
Expalin the different types of database users with their role in database environment?  
PS: CA  
SI:Different users with their role.
24. *LO: 8.8 and 8.9*                      *Type : Essay*                      *Scores : 5*  
What are keys? Explain the various keys in DBMS.  
PS: CA  
SI: Definition of keys: primary key, candidate key, alternate key and foreign key.
25. *LO: 8.9*                      *Type : Short answer*                      *Scores : 4*  
Explain the SELECT and PROJECT operation in relational algebra with suitable example.  
PS: CG  
SI:Definition of SELECT and PROJECT, give example.
26. *LO: 8.5*                      *Type : Short answer*                      *Scores : 3*  
What are the main tasks performed by database administrator?  
PS: CA  
SI: Role of DBA
27. *LO: 8.9*                      *Type : Short answer*                      *Scores : 4*  
Explain the UNION and INTERSECTION operation in relational algebra with suitable example.  
PS: CG  
SI: Definition of UNION and INTERSECTION, give example.

28. LO: 8.9

Type : Essay

Scores : 5

Consider the relation, Customer (Acc\_No, Name, Branch\_Name, Balance). Write the following relational algebra statements.

- a. Display the name of all customers.
- b. Display the name of customers whose balance amount is above 50,000.
- c. Display the details of all customers in KOCHI branch.
- d. Display the names and balance amount of customers in CALICUT branch whose balance amount is below 50,000.
- e. Display the account number and balance of all customers.

PS: CG

SI: Correct relational algebra statements.

**Assessment Worksheet 8.1**

1. List the names of various operations in relational algebra.
2. What is the purpose of using SELECT operation?
3. Distinguish between UNION and INTERSECTION operation.
4. State true or false. CARTESIAN PRODUCT combines two relations.
5. What is the use of PROJECT operation?

**Assessment Worksheet 8.2**

1. Lists the names of various types of data abstractions.
2. What is data independence?
3. Define physical data independence and logical data independence.
4. \_\_\_\_\_ level of data abstraction describes how the data is saved in storage devices.

### Introduction

This chapter introduces a new language called SQL to learners, which is used to communicate with a database. According to ANSI (American National Standards Institute), it is the standard language for relational database management systems. In this stage, the learners are familiarized with creation of tables, inserting data into a table, manipulating and deleting data in a table, modifying the structure of a table, removing a table etc. on relational database. In this chapter, we also introduce the concept of views. From this, the learners should get a clear cut idea about the concept of SQL. Some common relational database management systems that use SQL are: MySQL, Oracle, Sybase, Microsoft SQL Server, Access, Ingres etc. Here, we use one of the most popular open source RDBMS - MySQL to implement Structured Query Language. The teacher should provide learners with various types of questions to create a solid idea on SQL.

#### Values and Attitudes

- ✓ Appreciates SQL for managing data bases in a meaningful way.
- ✓ Developing sense for presenting ideas in a concise and comprehensive fashion.
- ✓ Increases the logical reasoning power.



## Unit Frame

Periods: 25

| Concepts/Ideas and Process skills   | Process/Activities with Assessments  | Learning outcomes   |
|---|--|---|
| Structured Query Language<br>✓ Understanding<br>✓ Communicating<br>✓ Observing<br>✓ Analysing | General discussion on database and RDBMS using real life examples.<br>Concluding with the need of a language to manage relational database system - SQL.<br><b>Assessment:</b><br>➤ Worksheet 9.1<br>➤ Preparation of notes<br>➤ Worksheet 9.2 | 1. Recognises the importance and features of Structured Query Language.                           |
| DDL, DML and DCL commands<br>✓ Understanding<br>✓ Communicating<br>✓ Observing<br>✓ Analysing | Discussion on components of SQL<br><b>Assessment:</b><br>➤ Preparation of chart that shows different categories of SQL commands and their purpose.   | 2. Explains the components of SQL.<br>3. Distinguishes the features of DDL, DML and DCL commands. |
| Data types in MySQL<br>✓ Understanding<br>✓ Observing<br>✓ Analysing                          | General discussion on MySQL and its features like data types and their properties.<br><b>Assessment:</b><br>➤ Preparation of notes   | 4. Identifies the characteristics of MySQL.<br>5. Lists different data types and their features.  |
| Constraints<br>✓ Understanding<br>✓ Observing<br>✓ Analysing                                  | Discussion on the need of constraints and different types of constraints available in MySQL.<br><b>Assessment:</b><br>➤ Preparation of chart shows the different data types, constraints and their characteristics.<br>➤ Preparation of notes  | 6. Explains the effect of different constraints.  |
| DDL commands<br>✓ Understanding<br>✓ Communicating<br>✓ Recognizing                           | General discussion on DDL commands like CREATE, ALTER and DROP.<br><b>Assessment:</b><br>➤ Lab activity on creation of different tables.<br>➤ Preparation of notes.  | 7. Performs operations using DDL commands like CREATE, ALTER, DROP.                               |

| Concepts/Ideas and Process skills   | Process/Activities with Assessments   | Learning outcomes   |
|---|---|---|
| DML commands<br>✓ Understanding<br>✓ Observing<br>✓ Recognizing<br>✓ Analyzing        | Group discussion on various DML commands used to insert, retrieve, edit, and remove data from the table.<br><b>Assessment:</b><br>➤ Preparation of notes.<br>➤ Lab work to familiarise the execution of various SQL commands.<br>➤ Queries<br>➤ Predicted outputs | 8. Uses DML commands SELECT, INSERT, UPDATE, and DELETE for data manipulation.<br>9. Identifies various clauses associated with SQL commands and their purpose.<br>10. Uses operators for setting different conditions. |
| Aggregate functions<br>✓ Understanding<br>✓ Observing<br>✓ Recognizing<br>✓ Analyzing | General discussion on aggregate functions in SQL.<br>Notes preparation.<br><b>Assessment:</b><br>Lab work to familiarise the execution of various SQL commands including aggregate functions.<br>➤ Correction of queries<br>➤ Predicted outputs                   | 11. Lists different aggregate functions and their usage.  |
| Nested query<br>✓ Understanding<br>✓ Observing  | General discussion on the need of nested queries in SQL with real life examples.<br><b>Assessment:</b><br>➤ Notes preparation.<br>➤ Lab work to familiarise the execution of various SQL commands including nested queries.<br>➤ Assignment                       | 12. Constructs nested queries for information retrieval.  |

**Process Assessment**

General discussions,  
Activity Log preparation,  
Lab work.

**Portfolio Assessment**

Activity Log, Practical log book  
SQL Tables

**Unit-wise Assessment**

- Written test can be conducted using the questions given in the Know your Progress section and sample questions provided in the textbook.

**Towards the Unit:****Introduction to Structured Query language**

(1 Period)

*Suggested activity : General discussion on introduction to SQL and notes preparation.*

Teacher asks some questions related to DBMS to revise the concept by using the worksheet.

- Invites responses randomly and ensures that the concepts of DBMS are clear into students. If not, take necessary steps to clarify it to the students.

Teacher initiates a general discussion on the importance of a language which is used to manipulate database.

- Students are asked individually to identify real life situations where the concept of database is applied. The following examples may be given as clues:
  1. School admission register, school library register, patient register in a hospital etc.
  2. Stock details of medicines in a medical shop.
  3. The results of class XII students stored in a computer.

Citing the above examples, teacher asks students whether they know how these databases are created.

- Responses are invited randomly and consolidation is made
- Worksheet 9.1 is given to the students. After completing it individually, correctness of the responses is ensured through group discussions. The responses are invited and consolidation is made.
- The teacher ensures that the consolidation points are written in the Activity Log.

### SQL commands

(5 Periods)

***Suggested activity: Assignment and Lab work to perform all commands in SQL.***

This activity can be performed at the final stage of the chapter to evaluate the knowledge of the learner.

- Teacher asks every student to create a table of their own choice. The table names can be similar, but they should have different fields.
- Encourage the students to enter data into the table. (at least 10 records)
- At this stage, ensure the difference in the structure of table, correct usage of data types and constraints in each column of table by peer to peer verification of students. Also ask the verifying student to write 10 questions based on the data on the table (questions should be framed in such a way that queries contain important commands).
- Then each student tries to write SQL queries for the questions.
- After completion of the SQL queries, peer evaluation is conducted and make necessary changes are made in the queries wherever necessary.
- Ask the students to do the above activities as a Lab activity and check whether the desired results are produced by the query or not. If not, ask them to correct the query.
- Students record the table details and corrected queries in their log book along with the output.

### PE Questions

Refer to the questions given in the Let us Practice section of the textbook and Part III of the Teacher text.

**TE Questions**

1. *LO : 9.1*                      *Type : Short answer*                      *Score : 2*  
 How is SQL different from other computer high level languages?  
 PS : CA  
 SI : Definition and purpose of SQL.
2. *LO : 9.3*                      *Type : Objective*                      *Score : 1*  
 Manu wants to add a new column to a table. What type of command is used to do it?  
 a) DML                      b) DDL                      c) DCL                      d) none of the above  
 PS : CA  
 SI : DDL
3. *LO : 9.7*                      *Type : Objective*                      *Score : 1*  
 (a) From the list given below select the names that cannot be used as a table name.  
 Adm\_No., Date, Salary2006, Table, Column\_Name, Address  
 PS : CA  
 SI : Date, Table  
 (b) Justify your selection.  
 PS : CA  
 SI : Table is a keyword, Date is a data type.
4. *LO : 9.5, 9.6, 9.7, 9.8, 9.11, 9.12*                      *Type : Essay*                      *Score : 5*  
 Consider the table given below and write SQL statements for the following queries.

| Item code | Item name | Unit Price | Stock |
|-----------|-----------|------------|-------|
| 1001      | Rice      | 38         | 150   |
| 1002      | Daal      | 48         | 98    |
| 1003      | Sugar     | 32         | 120   |
| 1004      | Chilly    | 52         | 90    |
| 1005      | Salt      | 14         | 65    |

- Create a table called STOCK as mentioned above with suitable data types.
- List the item which has minimum stock.
- Which is the costly item?
- List the items in the order of unit price.
- How many different items are there in the shop?

PS : CG

SI : Proper usage of Queries with correct syntax.

5. *LO : 9.7*                      *Type : Objective*    *Score : 1*

The command to eliminate the table CUSTOMER from a database is:

- REMOVE TABLE CUSTOMER
- DROP TABLE CUSTOMER
- DELETE TABLE CUSTOMER
- UPDATE TABLE CUSTOMER

PS : CA

SI : (b) DROP TABLE CUSTOMER

6. *LO : 9.9*                      *Type : Objective*    *Score : 1*

\_\_\_\_\_ keyword in SQL is used with wildcard characters.

- LIKE only
- IN only
- NOT IN only
- IN and NOT IN

PS : CA

SI : (a) LIKE only

7. *LO : 9.95, 9.10, 9.11*                      *Type : Short answer*    *Score : 3*

Consider the table ITEMS.

| Item Code | Name     | Category   | UnitPrice | SalesPrice |
|-----------|----------|------------|-----------|------------|
| 0001      | Pencil   | Stationery | 5.00      | 8.00       |
| 0002      | Pen      | Stationery | 8.00      | 10.00      |
| 0003      | Notebook | Stationery | 10.00     | 20.00      |
| 0004      | Chappal  | Footwear   | 50.00     | 70.00      |
| 0005      | Apple    | Fruits     | 60.00     | 90.00      |
| 0006      | Orange   | Fruits     | 40.00     | 60.00      |
| 0007      | Pen      | Stationery | 10.00     | 9.00       |

Predict the output of the following queries.

a) `SELECT ITEMCODE, NAME FROM ITEMS  
WHERE CATEGORY = 'STATIONERY';`

b) `SELECT * FROM ITEMS WHERE SALESPRICE < UNITPRICE;`

c) `SELECT CATEGORY, COUNT(*) FROM ITEMS  
GROUP BY CATEGORY;`

PS : CG

SI : Correct output

8. *LO : 9.8*                      *Type : Short answer*                      *Score : 3*

(a) Prabha created a table in SQL with 10 records. Which SQL command is used to change the values in a column of specified rows?

PS : CA

SI : UPDATE

(b) : Write the format also. Type : short answer

PS : CG

SI : syntax of UPDATE command.

9. *LO : 9.1*                      *Type : Objective*                      *Score : 1*

Give an example for RDBMS package.

PS : CA

SI : MySQL

10. *LO : 9.5, 9.6*                      *Type : Short answer*                      *Score : 4*

As a part of your school project you are asked to create a table Student with the fields RollNo, Name, Date\_of\_Birth and Score\_in\_IT.

i) Set the column RollNo as the primary key, the field Name should not be empty.

ii) Name the most appropriate SQL data type required to store the following data.

(a) Name of a student (maximum 70 characters).

(b) Date\_of\_Birth of a student.

(c) Percentage of marks obtained (correct to 2 decimal places).

PS : CA

SI : i) Primary key, Notnull

i) a) VARCHAR    b) DATE    c) DECIMAL(5,2)

11. *LO : 9.9*                      *Type : Objective*                      *Score : 1*

Which of the following is the correct order of keywords for SQL SELECT statement?

a) SELECT, FROM, WHERE    b) FROM, WHERE, SELECT  
 c) WHERE, FROM, SELECT    d) SELECT, WHERE, FROM

PS : CA

SI : a) SELECT, FROM, WHERE

12. *LO : 9.9*                      *Type : Objective*                      *Score : 1*

\_\_\_\_\_ command changes tuples in a table based on a condition.

a) PROJECT    b) SELECT    c) UNION    d) UPDATE

PS : CA

SI : d)UPDATE

13. *LO : 9.7*                      *Type : Short answer*                      *Score : 3*

Give the syntax of CREATE TABLE command.

PS : CG

SI : correct syntax

14. *LO : 9.7, 9.8*                      *Type : Essay*                      *Score : 5*

Explain four DML commands in SQL with syntax and example.

PS : CG

SI : Explanation of SELECT, INSERT, UPDATE, and DELETE commands.

15. *LO : 9.7, 9.8, 9.9, 9.10, 9.11*                      *Type : Essay*                      *Scores : 5*

A hospital has maintained a database for patients with the fields.

|              |             |             |
|--------------|-------------|-------------|
| IPNO         | Varchar(10) | Primary key |
| Patient Name | Varchar(30) |             |
| Age          | Number(3)   |             |
| RoomNo       | Number(3)   |             |



Write SQL queries to do the following.

- a) Construct the table.
- b) Modify the structure of the table by adding the field DoctorName.
- c) Update DoctorName field with a value 'LINDA' for a particular record with IPNO = 30
- d) Display name of the patients in the age group 20 to 30.
- e) Display details of all patients whose name start with An.

PS : CG

SI : Proper usage of Queries with correct syntax.

16. *LO : 9.10*      *Type : Objective*      *Scores : 1*

Which keyword can be used with `SELECT` command to avoid duplication of rows in the selection?

PS : CA

SI : `DISTINCT`

17. *LO : 9.6, 9.7*      *Type : Objective*      *Scores : 1*

Pick the odd one out.

- |                         |                         |
|-------------------------|-------------------------|
| (a) <code>CREATE</code> | (b) <code>SELECT</code> |
| (c) <code>UPDATE</code> | (d) <code>INSERT</code> |

PS : CA

SI : `CREATE`

18. *LO : 9.3, 9.4*      *Type : Short answer*      *Scores : 3*

(a) Classify the following SQL commands.

`CREATE TABLE`, `INSERT INTO`, `ALTER TABLE`, `DELETE`, `UPDATE`, `DROP TABLE`.

(b) List the features of each category.

PS : CG

SI : Classification into DDL, DML and their features.

**Assessment Worksheet 9.1**

1. What is DBMS?
2. Is it essential to implement DBMS rather than using conventional file keeping system? Justify your answer.
3. In RDBMS, where are the data stored?
4. Why is a table also called a relation?
5. In RDBMS, the rows and columns of tables are represented by some other names. What are they?
6. What is Degree and Cardinality?

**Assessment Worksheet 9.2**

1. SQL stands for \_\_\_\_\_.
2. What is the purpose of SQL?
3. What are the features of SQL?
4. How are SQL commands classified?
5. What are constraints?

# 10

## Server Side Scripting using PHP

### Introduction

This unit introduces to learners, the concept of server side scripting using PHP. After an introduction to PHP, this unit provides the learners the benefits of using PHP and MySQL. The next section explains how to set up the development environment, writing and running the Script and how to combine HTML and PHP. Since there are similarities between the syntax of PHP and C++, teachers should take maximum advantage of this while discussing PHP programming syntax. The unit then provides a basic knowledge of the output statements, variables, data types operators, control structures etc. While discussing arrays, the importance and advantage of associative array should be highlighted. In the next session, predefined functions and user defined functions are introduced. Important date and string functions are to be introduced to learners through examples.

The second half of this unit introduces 3 tier architecture and dynamic web page creation. After the discussion on various global variables, this section explains how input is collected using forms and passed to PHP script at server. All the examples illustrated here are to be done at the lab by the learner as it will help the learner to understand how input collected through forms is passed to the web server, and the difference between get and post methods.

The last part of the unit concentrates on connecting PHP with MySQL database. Two projects detailed here will introduce the learner to the new concept and make him/her confident in developing dynamic webpages using PHP. As PHP is the backbone of major websites and as there is ample opportunities in PHP for learners, teachers should provide projects and encourage learners in executing them.

#### Values and Attitudes:

- ✓ Identifies the importance of free software in software development.
- ✓ Identifies the importance of sharing of knowledge.

## Unit Frame

Period : 20

| Concepts/Ideas and Process skills   | Process/Activities with Assessments  | Learning outcomes   |
|---|--|---|
| <ul style="list-style-type: none"> <li>• Overview of PHP</li> <li>✓ Communicating and understanding</li> <li>✓ Observing</li> </ul>                                       | Slide presentation and discussion on the need for PHP.<br><b>Assessment:</b><br>➤ Preparation of notes.<br>➤ Assignment on benefits of PHP.  | 1. Lists the benefits of using PHP.   |
| <ul style="list-style-type: none"> <li>• Fundamentals of PHP</li> <li>✓ Communicating and understanding</li> <li>✓ Inferring</li> </ul>                                   | Discussion on various data types.<br>Demonstration of coding.<br><b>Assessment:</b><br>➤ Lab work.<br>➤ Preparation of notes.  | 2. Explains the syntax of PHP code.<br>3. Illustrates various data types and operators used in PHP. |
| <ul style="list-style-type: none"> <li>• Control Structures in PHP</li> <li>✓ Observing</li> <li>✓ Problem Solving</li> <li>✓ Classifying</li> </ul>                      | Discussion on various control structures.<br>Demonstration of coding.<br><b>Assessment:</b><br>➤ Lab work.<br>➤ Preparation of notes.  | 4. Constructs code from algorithm using control and looping structures in PHP.                      |
| <ul style="list-style-type: none"> <li>• Arrays in PHP</li> <li>✓ Observing</li> <li>✓ Problem Solving</li> </ul>   | General discussion on Arrays.<br><b>Assessment:</b><br>➤ Lab work.<br>➤ Preparation of notes.  | 5. Identifies the difference and use of different types of array.                                   |
| <ul style="list-style-type: none"> <li>• Functions in PHP</li> <li>✓ Communicating and understanding</li> <li>✓ Problem Solving</li> </ul>                                | General discussion on functions.<br><b>Assessment:</b><br>➤ Lab work.<br>➤ Preparation of notes.   | 6. Designs PHP functions for common tasks.  |
| <ul style="list-style-type: none"> <li>• Three Tier Architecture in PHP</li> <li>✓ Observing</li> <li>✓ Classifying</li> <li>✓ Communicating and understanding</li> </ul> | Demonstration of Websites.<br>General discussion on static and dynamic sites.<br>Seminar on three tier architecture.<br><b>Assessment:</b><br>➤ Seminar Report.<br>➤ Preparation of notes. | 7. Describes the client server environment.   |

| Concepts/Ideas and Process skills   | Process/Activities with Assessments  | Learning outcomes  |
|---|--|--|
| <ul style="list-style-type: none"> <li>• PHP Forms</li> <li>✓ Communicating and understanding</li> <li>✓ Classifying</li> </ul>   | Demonstration of different websites.<br>General discussion on the difference and advantages of get and post methods.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Work Sheet.</li> <li>➤ Lab Work.</li> <li>➤ Preparation of notes.</li> </ul> | 8. Selects the appropriate data submitting methods for different scenarios.          |
| <ul style="list-style-type: none"> <li>• Connecting PHP to Database (MYSQL)</li> <li>✓ Communicating and understanding</li> </ul> | Demonstration of connecting to database.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Work Sheet.</li> <li>➤ Lab Work.</li> <li>➤ Preparation of notes.</li> </ul>   | 9. Identifies the role of database connectivity in the creation of dynamic webpages. |

#### Process Assessment

- Involvement in the discussions.
- Lab work.

#### Portfolio Assessment

- Activity log book.
- Observation book.
- Documents prepared in the lab.
- Assessment worksheets.

#### Unit based Assessment

- Class test.
- Quiz on various data types and built-in functions in PHP.

## Towards the Unit:

### Overview of PHP

(1 Period)

*Suggested activity: Slide presentation, discussion, assignment and preparation of notes*

- The teacher displays slides on the benefits of PHP.
  - Slides on the important benefits of PHP.
  - Major websites developed using PHP.
  - Compares Client side and Server side scripting.
- This activity presents before learners all the details about the benefits of using PHP.
- The teacher concludes the discussion with the following points
  - Major developments in PHP language development.
  - Advantages of PHP language.
  - Instructs the students to prepare notes.

### Three Tier Architecture in PHP

(1 Period)

*Suggested activity: Demonstration, Seminar and Preparation of notes*

- The teacher demonstrates real sites using static and dynamic web pages.
- The teacher illustrates their working and defines the 3 tier architecture.
  - The learner observes the two different types of websites.
  - Learners prepare a table showing the differences between static and dynamic websites.
- Learners identify use of 3 tier architecture in sites using dynamic web pages.
- The learners are expected to
  - Submit seminar reports to teacher.
- Instructs the students to prepare notes

## PHP Forms

(1 Period)

*Suggested activity: Lab work, work sheet, preparation of notes.*

- The teacher illustrates GET and POST methods.
- The teacher asks learners to do a small project which involves values to be passed from client to server.
  - o The learners execute the same project using GET and POST methods.
  - o Learners prepare a table showing the differences observed by them while using GET and POST methods.
- Learners recognise where to use GET and POST methods.
- After the lab activity, learner is expected to
  - o submit assignments/reports to teacher.

## TE Questions

1. *LO: 10.2* *Type : Objective* *Score: 1*  
 Which of the following printing construct/function accepts multiple parameters?  
 a. echo   b. print   c. printf   d. All of the above  
 PS : CA  
 SI : a
2. *LO: 10.5* *Type : Objective* *Score: 1*  
 What will be the output of the following code?  

```
$a = 10;
if ($a > 5 OR < 15)
    echo 'true';
else
    echo 'false';
```

 a. true   b. false   c. No output   d. Parse Error  
 PS : CA  
 SI : d
3. *LO: 10.4* *Type : Objective* *Score: 1*  
 Which of the following variable names are invalid?  
 a. \$var\_1   b. \$var1   c. \$var-1   d. \$var/1   e. \$v1

PS : CA

SI : c, d

4. *LO: 10.4* *Type : Objective* *Score: 1*

What will be the output of following code?

```
$a = 10;
echo 'Value of a = $a';
```

- a. Value of a = 10      b. Value of a = \$a  
c. Undefined          d. Syntax Error

PS : CA

SI : a

5. *LO: 10.7* *Type : Objective* *Score: 1*

What will be the output of the following code?

```
$Rent = 250;
function Expenses($Other)
{
    $Rent = 250 + $Other;
    return $Rent;
}
Expenses(50);
echo $Rent;
```

- a. 300    b. 250      c. 200      d. Program will not compile

PS : CA

SI : b

6. *LO: 10.2* *Type : Objective* *Score: 1*

The following PHP variables are declared:

```
$company1 = 'ABS Ltd';
$company2 = ',Sydney';
```

Which of the following is not a correct way of printing 'ABS Ltd,Sydney'?

- a. echo '\$company1 \$company2';  
b. echo '\$company1 \${\$company2}';  
c. echo '\$company1 {'ABS Ltd}';  
d. echo '\$company1 {\$\$company2}';

PS : CG

SI : a



7. *LO: 10.2* *Type : Objective* *Score: 1*  
 Which of the following is correct with regard to echo and print?  
 a. echo is a construct and print is a function      b. Both are functions  
 c. echo is a function and print is a construct      d. Both are constructs  
 PS : CA  
 SI : d
8. *LO: 10.2* *Type : Objective* *Score: 1*  
 Which of the following functions output text?  
 a. echo()   b. print()      c. println()      d. display()  
 PS : CA  
 SI : a, b
9. *LO: 10.11* *Type : Objective* *Score: 1*  
 Study following steps and determine the correct order.  
 (1) Open a connection to MySQL server  
 (2) Execute the SQL query  
 (3) Fetch the data from query  
 (4) Select database  
 (5) Close Connection  
 a. 1, 5, 4, 2, 1      b. 1, 4, 2, 3, 5      c. 4, 1, 2, 3, 5      d. 4, 1, 3, 2, 5  
 PS : CG  
 SI : b
10. *LO: 10.2* *Type : Objective* *Score: 1*  
 Which of the following is one correct way to set a variable?  
 a. &var = ` ` ;      b. \$var = " " ;      c. var = ` ` ;  
 d. \$var = ` ;      e. \$var = ` ` ;  
 PS : CG  
 SI : e
11. *LO: 10.2* *Type : Objective* *Score: 1*  
 Which of the following statements will cause an error?  
 a. echo " " ;      b. print " " ;      c. echo ` ` ;  
 d. print ` ` ;      e. echo \$variable ;  
 PS : CG  
 SI : All are correct

12. *LO: 10.2* *Type : Objective* *Score: 1*  
 Which example demonstrates valid usage of the `strlen()` function?  
 a. `echo strlen("Is this correct?")`  
 b. `$variable strlen("Is this correct?");`  
 c. `echo strlen(What about this?);`  
 d. `$variable = strlen("How about this?");`  
 PS : CG  
 SI : d
13. *LO: 10.7* *Type : Objective* *Score: 1*  
 What will be the output of the following PHP code?  

```
<?php
$op2 = "friends";
function foo($op1)
{
    echo $op1;
    echo $op2;
}
foo("hello");
?>
```

 a. hellofriends    b. Error    c. hello    d. hellofriendsfriends  
 PS : CG  
 SI : a
14. *LO: 10.2* *Type : Objective* *Score: 1*  
 The dot operator (.) is used in PHP for \_\_\_\_  
 a. multiplication    b. concatenation    c. modulus    d. delimiter  
 PS : CA  
 SI : b
15. *LO: 10.4* *Type : Objective* *Score: 1*  
 All variables in PHP start with which symbol  
 a. ?    b. !    c. \$    d. &    e. %  
 PS : CA  
 SI : c
16. *LO: 10.10* *Type : Objective* *Score: 1*  
 How do you get information from a Form that is submitted using the Get method?



SI : d

22. *LO: 10.10* *Type : Objective* *Score: 1*

Which of the following method sends input to a script via a URL?

- a. Get    b. Post    c. Both    d. None

Process Skill : CA

SI : a

23. *LO: 10.10* *Type : Objective* *Score: 1*

Which of the following method is suitable when you need to send larger form submissions?

- a. Get    b. Post    c. Both Get and Post    d. None of the above

Process Skill : CA

SI : b

24. *LO: 10.11* *Type : Objective* *Score: 1*

`mysql_connect()` does not take following parameter.

- a. database name    b. database host  
c. user ID    d. password

Process Skill : CA

SI : a

25. *LO: 10.1* *Type : Objective* *Score: 1*

What is the expansion of LAMP?

Process Skill : CA

SI : Linux-Apache-MySQL-PHP

26. *LO: 10.6* *Type : Short answer* *Score: 2*

How do you declare an array in PHP?

PS : CA

SI : Syntax & Example

27. *LO: 10.2* *Type : Short answer* *Score: 3*

What is the use of `print` in PHP?

PS : CA

SI : It is a language construct for output. Can be used without parentheses. Examples.

28. *LO: 10.10* *Type : Essay* *Score:5*

Differentiate between GET and POST methods ?

PS : CA

SI : Data Visibility, Book Marking, Submission method (along with URL etc), Speed & Security, Character limit.

29. *LO: 10.5*                      *Type : Short answer*                      *Score: 3*

What types of loops exist in PHP?

PS : CA

SI : while, do - while, for

30. *LO: 10.11*                      *Type : Short answer*                      *Score: 2*

How do you create a MySQL connection in PHP?

PS : CA

SI: `$link_id=mysql_connect("local host", "User ID", "Password");`

31. *LO: 10.11*                      *Type : Short answer*                      *Score: 2*

How do you select a database in PHP?

PS : CA

SI : `mysql_select_db($database);`

32. *LO: 10.8*                      *Type : Short answer*                      *Score: 2*

How do you find the length of a string? Explain with an example.

PS : CA

SI : `strlen()` syntax, example

33. *LO: 10.6*                      *Type : Short answer*                      *Score: 2*

What is meant by an associative array? Give an Example

PS : CA

SI : Arrays that use string keys. Example

34. *LO: 10.10*                      *Type : Essay*                      *Score: 5*

What is the importance of "method" attribute in an HTML Form? Explain.

PS : CA

SI : Determines how to send the form-data.

Two methods GET and POST.

The default method is GET.

GET appends information on the URL.

Information sent POST method is invisible.

POST has no limits on the amount data to send.

35. *LO: 10.10*                      *Type : Short answer*                      *Score: 2*  
 What is the importance of “action” attribute in an HTML Form?  
 PS : CA  
 SI : Determines how to send the form-data.
36. *LO: 10.8*                      *Type : Short answer*                      *Score: 2*  
 How can we find current date and time in PHP?  
 PS : CA  
 SI : The `date()` function
37. *LO: 10.8*                      *Type : Short answer*                      *Score: 3*  
 How can we create a table using PHP and MySQL?  
 PS : CA  
 SI : Create SQL. Execute SQL using `mysql_query()` in PHP.
38. *LO: 10.1*                      *Type : Short answer*                      *Score: 4*  
 What is the difference between JavaScript and PHP?  
 PS : CA  
 SI : JavaScript - client side scripting language  
       PHP - server side scripting language.
39. *LO: 10.8*                      *Type : Short answer*                      *Score: 3*  
 Explain the following functions:  
 a. `strlen()`                      b. `strpos()`                      c. `strcmp()`  
 PS : CA  
 SI : a. Returns the length of a string, syntax & example.  
       b. Returns the position of the first occurrence of a string inside another string, syntax & example  
       c. Compares two strings, syntax & example
40. *LO: 10.6*                      *Type : Short answer*                      *Score: 3*  
 What is the use of `print_r()` function.  
 PS : CA  
 SI : Used to print information about a variable. Syntax & example
41. *LO: 10.11*                      *Type : Short answer*                      *Score: 3*  
 What is the importance of `mysql_fetch_array()`?  
 PS : CA  
 SI : Used to populate rows of data as an array from a MySQL result handle. Syntax & example

42. *LO: 10.10*                      *Type : Short answer*                      *Score: 3*  
 How can we access the data sent through the URL with the GET method?  
 PS : CA  
 SI : Use \$\_GET array    Syntax & example
43. *LO: 10.10*                      *Type : Short answer*                      *Score: 3*  
 How can we access the data sent through the URL with the POST method?  
 PS : CA  
 SI : Use the \$\_POST array.    Syntax & example
44. *LO: 10.10*                      *Type : Short answer*                      *Score: 3*  
 What does \$GLOBALS means?  
 PS : CA  
 SI : Associative array. Includes references to all variables. Defined in the global scope.
45. *LO: 10.10*                      *Type : Short answer*                      *Score: 3*  
 What does \$\_SERVER means?  
 PS : CA  
 SI : An array including information created by the web server

**Assessment Worksheet – 10.1**

Visit any ten dynamic websites and find out which method the form uses to pass values to server and prepare a chart as follows:

| Sites using Get method | Sites using Post method |
|------------------------|-------------------------|
|                        |                         |

**Assessment Worksheet – 10.2**

Create a website that accepts the admission number of a student and displays his class, division, name, group name, and name of the subjects he learns.

## Introduction

In Class XI, most of our discussion on computing was based on a single processor which can execute relatively small jobs on it. When the bulk of job increased, the amount of computation needs to be increased and hence a number of processors and distribution of jobs to different processors are needed. For class XII students, the detailing of principles of such distributed computing is too advanced. Therefore this chapter aims just to introduce some fundamental principles and terms associated with advanced computing techniques. The teacher can explain the concept of distributed computing by justifying the need of multiple processors to perform big tasks which require high computational power. Before introducing parallel computing, the working principle of serial computing must be given. After the discussion of all the distributed computing paradigms, the learner should be able to compare and analyze the advantages and disadvantages of each paradigm.

The Artificial Intelligence (AI) is the branch of computer science in which study and research of designing intelligent machines are discussed. There are different approaches and divisions for AI. In this chapter, only computational intelligence paradigms and some of its major applications are explained.

The teacher can use general discussion for introducing the concepts and slide show or multimedia presentation for the illustration. Smart phone applications and software may be used to demonstrate the biometric and automatic speech recognition for explaining applications of computational intelligence.

### Values and Attitudes

- ✓ A big task can be accomplished by distributing them to many cooperating individuals.
- ✓ Better communication will result in better completion of a task.
- ✓ Motivation to increase technological growth.
- ✓ Automating, monitoring and controlling different activities with the help of machines.



## Unit Frame

Periods: 25

| Concepts/Ideas and Process skills   | Process/Activities with Assessments  | Learning outcomes  |
|---|--|--|
| Distributed computing paradigms<br>✓ Identifying<br>✓ Explaining<br>✓ Communicating | General discussion on the concept of distributed computing by explaining its advantages and disadvantages and introducing different distributed computing paradigms.<br><b>Assesment:</b> <ul style="list-style-type: none"> <li>Preparation of note</li> </ul>                                    | 1. Identifies different distributed computing paradigms. |
| Parallel computing<br>✓ Identifying<br>✓ Analyzing<br>✓ Comparing                   | General discussion on parallel computing by differentiating it with serial computing which is already familiar with it.<br><b>Assesment:</b> <ul style="list-style-type: none"> <li>Preparation of notes</li> <li>Worksheet 11.1</li> </ul>  | 2. Compares serial computing and parallel computing      |
| Grid computing<br>✓ Identifying<br>✓ Analyzing<br>✓ Comparing                       | Discussion and illustration of grid computing with its advantages and disadvantages.<br><b>Assesment:</b> <ul style="list-style-type: none"> <li>Preparation of notes</li> <li>Worksheet 11.1</li> </ul>   | 3. Recognizes the need of grid computing.                |
| Cluster computing<br>✓ Identifying<br>✓ Analyzing<br>✓ Comparing                    | Discussion and illustration of cloud computing with its advantages and disadvantages.<br><b>Assesments:</b> <ul style="list-style-type: none"> <li>Preparation of notes</li> <li>Worksheet 11.1</li> </ul>   | 4. Identifies cluster computing techniques.              |
| Cloud computing<br>✓ Identifying<br>✓ Analyzing<br>✓ Comparing                      | General discussion and illustration by slide presentation on the concept of cloud computing by demonstrating different services in cloud computing.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>Preparation of notes</li> <li>Worksheet 11.1</li> <li>Quiz competition</li> </ul> | 5. Analyses the need of cloud computing methods.         |

| Concepts/Ideas<br>Process skills  | Process/Activities with<br>Assessments   | Learning outcomes  |
|---|--|--|
| Artificial intelligence<br>✓ Identifying<br>✓ Explaining                                    | General discussion on artificial intelligence by introducing knowledge pyramid and Turing test.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>Preparation of notes</li> <li>Worksheet 11.2</li> </ul>   | 6. Explains the role of artificial intelligence in modern computing. |
| Computational intelligence and its different paradigms<br>✓ Identifying<br>✓ Comparing      | General discussion on computational intelligence and its different paradigms<br><b>Assessments:</b> <ul style="list-style-type: none"> <li>Preparation of notes</li> <li>Assignment</li> <li>Worksheet 11.2</li> </ul>   | 7. Identifies different computational intelligence paradigms.        |
| Applications of computational intelligence.<br>✓ Identifying<br>✓ Observing<br>✓ Explaining | Demonstration and multimedia presentation and discussion on different applications of computational intelligence using mobile phone applications and software.<br><b>Assessments:</b> <ul style="list-style-type: none"> <li>Preparation of notes</li> <li>Slide/Multimedia Presentations</li> <li>Worksheet 11.2</li> </ul> | 8. Explains applications of computational intelligence.              |

### Process Assessment

Involvement in the discussion and demonstration

### Portfolio Assessment

Activity log

Assessment worksheets

### Unit wise Assessment

- Written Test may be conducted using questions provided in the textbook
- Quiz competition
- Assignment

Towards the unit:

## Applications of computational intelligence

(2 Periods)

*Suggested Activity: Demonstration, presentation and discussion*

Before starting the demonstration, the teacher asks the students to list some of the applications or examples of artificial intelligence they are already familiar with.

- Some popular and familiar examples like robots and biometrics can be expected in their list.
- Mobile applications including face recognition, online handwriting recognition, biometric punching system etc can be used for demonstrating the biometric applications.
- Speech recognition software may be demonstrated such as voice search of google.
- Teacher can demonstrate the functioning of different types of robots with the help of multimedia presentation.
- Similarly, teacher can demonstrate live software for natural language processing, speech recognition, computer vision etc.
- If software is not available, videos and animations can be used for demonstration.
- Teacher discusses recent researches and developments in AI which are not explained in text book to make the learner more interested.

During the above activities the learner can note their responses in activity log and the teacher has to ensure that the learners are doing the same. Maximum participation and contribution of learner in the discussion must be ensured. After demonstration and discussion, the teacher can ask the learner questions related to the latest advancements in computational intelligence.

## TE Questions

1. *LO 11.1*                      *Type: Objective*    *Score 2*

Consider the following statements about distributed computing and state True/False.

- i) In distributed computing, parts of a program are run simultaneously from two or more computers which are communicating with each other.
- ii) WWW is an example for large distributed computing.

PS: CA

SI: i) True                      ii) True

2. *LO 11.1*                      *Type: Short answer*    *Score 2*

The distributed computing method has some advantages and disadvantages. What are they?

PS: CA

SI: List of advantages and disadvantages.

3. *LO 11.2*                      *Type: Short answer*    *Score 2*

Justify the following statement.

"Parallel computing can execute a program much faster than a serial computing."

PS: CG

SI: Justification by listing the merits of parallel computing.

4. *LO 11.3*                      *Type: Short answer*    *Score 3*

Name the paradigm of distributed computing in which more number of computers and instruments are connected to form a single huge powerful computer and list its advantages and disadvantages.

PS: CG

SI: Grid computing and its advantages and disadvantages.

5. *LO 11.4*                      *Type: Short answer*    *Score 3*

Write a short note about cluster computing.

PS: CA

SI: Short description about cluster computing.



10. *LO 11.5, 11.3*      *Type: Short answer*      *Score 3*  
Compare grid computing and cloud computing paradigm of distributed computing.  
PS: CA  
SI: Correct comparison or differentiation.
11. *LO 11.6*      *Type: Essay*      *Score 5*  
Draw the knowledge pyramid and briefly explain the terms in it.  
PS: CA  
SI: Figure of knowledge pyramid and brief explanation of its terms.
12. *LO 11.6*      *Type: Short answer*      *Score 2*  
Briefly explain the Turing test approach of Artificial Intelligence.  
PS: CG  
SI: Description of Turing test.
13. *LO 11.7*      *Type: Objective*      *Score 1*  
Fill in the blanks of the following sentence.  
The study of control and communication between man and machine is called \_\_\_\_\_.  
PS: CG  
SI: Cybernetics
14. *LO 11.7*      *Type: Short answer*      *Score 2*  
List four paradigms of computational intelligence.  
PS: CA  
SI: ANN, Evolutionary computing, Swarm intelligence, Fuzzy logic
15. *LO 11.7*      *Type: Objective*      *Score 1*  
Choose the correct answer from the following.  
In Artificial Intelligence, ANN stands for  
i)      Artificial Network of Neural  
ii)     Advanced Neural Network  
iii)    Artificial Neural Network  
iv)    Architectural Neural Network

PS: CS

SI: iii

16. *LO 11.8*                      *Type: Essay*    *Score 10*

One of the recent developments in Computer Science is the use of computational intelligence in different real life applications. Briefly explain any five areas of application of computational intelligence.

PS: CA

SI: Brief explanation of any five applications of computational intelligence.

17. *LO 11.8*                      *Type: Short answer*    *Score 2*

The investigators can identify the criminals by using finger prints from the crime site. Name this application of computational intelligence and give one more similar real life example.

PS: CA

SI: Speaker identification, Retina identification or similar one.

18. *LO 11.8*                      *Type: Short answer*    *Score 2*

The terms Robotics and Robots are not same. Differentiate between them.

PS: CA

SI: Robot is an electro mechanical device and Robotics is the study about designing and manufacturing Robots.

19. *LO 11.8*                      *Type: Short answer*    *Score 2*

Differentiate between Bioinformatics and Biometrics.

PS: CG

SI: Bioinformatics is the application of computer technology for processing biological information. Biometric is the measurement related to human characteristics and traits.

20. *LO 11.5*                      *Type: Objective*    *Score 2*

Consider the following situation, and based on that, identify the name of service provided in cloud computing.

- i) Converting an MS word document to MS Excel document using a software installed in a remote server.
- ii) A server is used for storing our file and for performing large amount of computation.

PS: CG

SI: i) SaaS            ii) IaaS

21. *LO 11.6*            *Type: Objective*            *Score 2*

The following are the terms in the knowledge pyramid. Arrange them in the correct order.

Wisdom, Knowledge, Data, Information, Intelligence, Symbols

PS: CA

SI: Symbols, Data, Information, Knowledge, Intelligence, Wisdom (or the reverse order).

### Assessment worksheet 11.1

1. Serial computing uses \_\_\_\_\_ processor(s) and parallel computer uses \_\_\_\_\_ processor(s).
 

|             |          |             |          |
|-------------|----------|-------------|----------|
| a) single   | single   | c) single   | multiple |
| b) multiple | multiple | d) multiple | single   |
2. List the advantages of parallel computing.
3. List any two applications of Grid computing.
4. List the advantages of cloud computing.
5. Differentiate SaaS and PaaS in cloud computing.

### Assessment worksheet 11.2

1. At the top of knowledge pyramid is \_\_\_\_\_.
 

|         |              |           |                 |
|---------|--------------|-----------|-----------------|
| a) Data | b) Knowledge | c) Wisdom | d) Intelligence |
|---------|--------------|-----------|-----------------|
2. The Turing test was proposed by \_\_\_\_\_.
3. List any two practical application of NLP.
4. The following are the paradigms of computational intelligence. ANN, EC, SI and FS. What are their expanded form?
5. Which technology is used for building an application based on the geographical positions of the earth? Identify any two such location based applications.



### Introduction

We live in an era of information. Information and Communication Technology (ICT) which integrates telecommunication and computer networking, has contributed a lot to the process of exploring information. The Internet and related services are conquering the world day by day. People have started accessing these facilities easily using their mobile devices like cellular phones, lap tops, tablets etc. This chapter starts with a detailed explanation of the important ICT services that help the common man in his day-to-day life. Then, the discussions continue on the importance of Intellectual Property Rights (IPR) and the issues related to it. Even though Internet has several merits, we need to be aware of the issues and threats behind it. Cyber-related crimes are increasing day by day. It is so important to know how we can take safety measures while using the Internet. The chapter ends with sections on Cyber laws, IT act, Cyber forensics and infomania. The teacher is expected to introduce these topics by correlating the real life experience of the students with the contents of this chapter, with utmost care.

### Values and Attitudes

- ✓ Uses ICT effectively and enjoys the services of the Government with more transparency.
- ✓ Conducts business transactions and shares information in a smarter way making use of ICT applications.
- ✓ Overcomes the limitations of traditional learning by exploring new ways of learning with the help of ICT.
- ✓ Works with the Internet and make use of all the services of it, for the benefit of mankind without compromising on ethics.
- ✓ Avoids the chances of cyber attacks/cyber crimes by keeping in mind the authority of cyber laws, and also keeps away from the overflow of information.

## Unit Frame

Periods: 15

| Concepts/Ideas and Process skills  | Process/Activities with Assessments  | Learning outcomes  |
|--|--|--|
| Application of ICT services<br>✓ Communicating<br>✓ Understanding  | General discussion on the importance of various ICT services.<br><b>Assessment:</b><br>➤ Preparation of notes.   | 1. Uses the various ICT services like e-Governance, e-Business and e-Learning.   |
| Types, infrastructure, functions, advantages and challenges of e-Governance<br>✓ Classifying<br>✓ Identifying<br>✓ Differentiating<br>✓ Communicating<br>✓ Understanding | General discussion on the concept of e-Governance. Differentiating G2G, G2C, G2B and G2E gets familiar with the interactions in e-Governance. Various components of e-Governance setup. Group discussion on advantages and challenges of e-Governance. Real-time demonstration of a typical e-Governance website.<br><b>Assessment:</b><br>➤ A group quiz based on various interactions and infrastructure of e-Governance.<br>➤ Worksheet, Chart preparation, Preparation of notes. | 2. Details e-Governance and its infrastructure.<br>3. Identifies advantages and limitations of e-Governance.               |
| Concept of e-Business, its related fields, functions, advantages and challenges.<br>✓ Identifying<br>✓ Communicating<br>✓ Understanding<br>✓ Classifying                 | General discussion followed by group discussion with the help of demonstration using electronic slide, chart or blackboard.<br><b>Assessment:</b><br>➤ Preparation of notes, Worksheet, Assignment   | 4. Explains all about e-Business.<br>5. Gets acquainted with various components, advantages and limitations of e-Business. |
| Scope of e-Learning and its tools, advantages and challenges.<br>✓ Classifying<br>✓ Recognising  | General discussion followed by group discussion with the help of demonstration using electronic slide.   | 6. Recognises the concept and functions of e-learning.<br>7. Uses e-Learning tools to overcome the                         |

| Concepts/Ideas and Process skills   | Process/Activities with Assessments  | Learning outcomes   |
|---|--|---|
| <ul style="list-style-type: none"> <li>✓ Exploring</li> <li>✓ Communicating</li> </ul>  | Demonstration of e-Learning websites on-line.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Preparation of notes, worksheet, chart preparation, seminar etc.</li> </ul>   | limitations of traditional learning.<br>8. Identifies advantages and limitations. |
| Intellectual property right as part of information security <ul style="list-style-type: none"> <li>✓ Understanding</li> <li>✓ Communicating</li> <li>✓ Familiarising</li> </ul> | General discussion on information security issues. Demonstration using slides.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Seminar, worksheet, Preparation of notes etc.</li> </ul>                             | 9. Lists and explains various intellectual property rights.                       |
| Cyber space - the virtual environment with Internet <ul style="list-style-type: none"> <li>✓ Recognising</li> <li>✓ Familiarising</li> <li>✓ Communicating</li> </ul>           | Discussion using case studies from real life situations. Slide presentation and Role-play.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Worksheet, Preparation of notes etc.</li> </ul>                          | 10.Explains cyber space.  |
| Various types of Cyber crimes <ul style="list-style-type: none"> <li>✓ Understanding</li> <li>✓ Identifying</li> <li>✓ Communicating</li> <li>✓ Illustrating</li> </ul>         | General discussion followed by illustrations. Demonstrating case studies using electronic media, seminar, role-play etc.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Tests, Assignment, seminar etc.</li> </ul> | 11. Distinguishes different types of cyber crimes.                                |
| Cyber laws and ethics. Application of Cyber forensics. <ul style="list-style-type: none"> <li>✓ Recognising</li> <li>✓ Familiarising</li> <li>✓ Identifying</li> </ul>          | General discussion followed by presentation. Preparation of notes.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Assignment, seminar, worksheet etc.</li> </ul>   | 12.Explains cyber laws and ethics.<br>13.Scope of cyber forensics.                |
| Information Technology Act <ul style="list-style-type: none"> <li>✓ Understanding</li> <li>✓ Identifying</li> <li>✓ Communicating</li> </ul>                                    | General discussion and illustration. Slide presentation and preparation of chart.<br><b>Assessment:</b> <ul style="list-style-type: none"> <li>➤ Worksheet, etc.</li> </ul>  | 14. Identifies the importance of IT act.  |

| Concepts/Ideas and Process skills   | Process/Activities with Assessments   | Learning outcomes         |
|---|---|---------------------------|
| Infomania - overloading of information from various sources<br>✓ Recognising<br>✓ Familiarising<br>✓ Communicating<br>✓ Identifying solutions | Group discussion based on real life experiences. Demonstration using slides.<br><b>Assessment:</b><br>➤ Assignment, Preparation of notes etc. | 15. Recognises infomania. |

### Process Assessment

- Assignment about e-Business/e-Governance.
- Seminar on Cyber crimes/e-Learning.
- Group Quiz on the topic 'ICT Services'.
- Assignment on the topic 'Information Security'.

### Portfolio Assessment

- Activity log book.
- Assignments.
- Seminar reports.
- Worksheets.

### Unit Assessment

- Written tests may be conducted based on selected topics.
  - o Students can be assigned to prepare questions based on the topic.
  - o The questions brought by the students must be analysed by the teacher and some modifications can be suggested.
  - o The teacher can also contribute questions so that a pool of questions can be collected.
  - o Learners are asked to pick two questions from the pool to write the answers.
- A quiz can be planned by the teacher on selected topics.
  - o Students may be divided into two or three groups.
  - o The topics must be announced earlier.
  - o One among the learners can be the scorer.
  - o Teacher should ensure the participation of all learners.

## Towards the Unit

The teaching-learning activities for this chapter can be general discussion, group discussion, panel discussion, debate, role-play etc. The teacher has the freedom to transact the content by performing any suitable activity.

For assessment, the teacher can conduct activities like seminar, quiz, tests, assignment etc. and the hard copies of seminar report, tests, assignments etc. can be kept as part of portfolio.

## ICT Services

(3 Periods)

### *Suggested Activity: Group discussion*

The teacher begins the class by narrating the popular ICT services like e-Governance, e-Business, e-Learning etc.

Teacher divides the students into four groups for conducting a group discussion. She/he initiates the group activity by contributing some discussion points about e-Governance/e-Business/e-Learning in each group. Teacher can come up with some real life situations where e-Governance is used. Each group is given separate technologies.

- Teacher allows the learners to think freely about the ICT service that the group is going to discuss, in terms of its significance/advantages, infrastructure, limitations etc.
- Each group discusses the topic among themselves and presents their findings.
- Teacher consolidates the discussion by listing out the important points. Compares the services and elaborates the importance of each.
- Lists out popular sites related to e-Governance/e-Business/e-Learning.
- Asks students to prepare a list containing the advantages and limitations of e-Governance/e-Business/e-Learning.
- Instructs students to prepare notes.

## Cyber Crimes

(2 Periods)

### *Suggested Activity: Panel discussion*

In order to conduct a panel discussion, the teacher needs to invite four or more people to the class room. The panel may contain an advocate, a

person from the Cyber Cell of the Government, a person who is an expert in the field, a teacher from another school and so on.

The learners must be informed of this earlier and may be asked to be prepared with relevant questions for the panel discussion.

The panel of people including the teacher sits in a separate area in the class room.

The teacher initiates the discussion by posing some questions related to this topic. The questions can be as follows:

- What do you mean by cyber crimes? How do they affect the common people?
- Can you recollect a cyber crime recently committed in our country?
- Who is responsible for these cyber-related criminal activities?
- How can we put an end to these acts?

(Instead of questions, a recent real-life cyber crime can be narrated.)

- The learner responds by asking doubts or seeking clarifications related to cyber-related terms which they are familiar with, like Phishing, Hacking etc.
- The person from the panel explains and satisfies the learner.
- Another student asks about the cyber crimes against individuals.
- The experts in the panel respond and give details.
- The teacher consolidates the different aspects of the topic and urges the learners to fight against these kinds of crimes.
- The teacher instructs the learners to note down the points.

### **Infomania**

(1 Period)

#### ***Suggested Activity: Debate***

The teacher needs to inform the learners about the topic for debate beforehand, and give them a stipulated time after giving the topic.

Teacher divides the students into two groups. The topic of debate can be as follows:

The learners have a short discussion in the group before starting the debate. One of the students is selected as the moderator for the debate.

Group 1 is supporting the overflowing of information and Group 2 is against the flooding of information.

- Groups interact by presenting various view points.
- Moderator interferes when the discussions get heated beyond a limit.
- Teacher observes.
- Students are encouraged to present new findings.
- Teacher consolidates and details the state of infomania.
- Learners are allowed to prepare short notes.

### Cyber crimes/Cyber laws/IT Act

(2 Periods)

#### *Suggested Activity: Role-play*

Teacher identifies five students from the class prior to this activity. Each of them is assigned a role to act out in the class. One student may be 'White hacker', another one 'Black hacker'. 'Cyber law' may be the role of the third student. The fourth and fifth students take the roles of 'Cyber Ethics' and 'Common man' respectively. The learners can collect some details from the class XI text book regarding hacking, phishing etc. The teacher must explain the role of each student participating in the activity and make sure that the topic assigned is clear.

The activity is initiated by a general talk/discussion by the teacher about the relevance of the topics.

- The play starts by the role of White hacker and he justifies his actions (white hacking is done with good intention).
- Then the Black hacker speaks about the cyber crimes he does and the benefits he gains from it. He only speaks about his personal benefits, money etc. He is not bothered about the public.
- Then the student who plays the role of Cyber ethics reminds the moral values and moral principles to be followed while working with Internet.
- The student who plays the Common man's role reveals the ill effects of cyber crimes.
- The legal side and punishments related to cyber crimes are acted out by the learner who plays the role of Cyber law.

- Teacher monitors the play and makes other students note down the important points.
- Teacher consolidates the activity by listing out the negative impact of cyber-related crimes and the steps to control those things legally.

### TE Questions

1. *LO: 12.1*                      *Type: Objective*    *Score 1*

Which of the following interactions in e-Governance is used to aid business community?

- a. G2G                                      b. G2C                                      c. G2B  
d. G2E                                      e. None of the above

PS : CA

SI: c. G2B

2. *LO: 12.1, 12.2*                      *Type: Objective*    *Score 1*

Choose the correct pair from the following.

- a. e-Governance - [www.edistrict.kerala.gov.in](http://www.edistrict.kerala.gov.in)  
b. e-Learning - [www.spark.gov.in](http://www.spark.gov.in)  
c. e-Banking - [www.dhsekerala.gov.in](http://www.dhsekerala.gov.in)  
d. e-Business - [www.incometaxindia.gov.in](http://www.incometaxindia.gov.in)

PS : CA

SI : a. e-Governance - [www.edistrict.kerala.gov.in](http://www.edistrict.kerala.gov.in)

3. *LO: 12.6*                                      *Type: Objective*    *Score 1*

Even though Internet provides mankind with a lot of useful services, illegal activities are also increasing day by day. Identify the name given to these unhealthy activities in Internet.

PS : CA

SI : Cyber crimes

4. *LO: 12.5*                                      *Type: Objective*    *Score 1*

A virtual environment created by the computer systems connected to Internet where social interactions dominate is known as \_\_\_\_\_.

PS : CA

SI : Cyber space





11. *LO: 12.6, 12.8 Type: Short answer* *Score 2*

Match the following:

|                         |   |
|-------------------------|---|
| 1. Harassment           | a. Placing hidden cameras in public places.                         |
| 2. Identity theft       | b. Browsing Internet through somebody's account without permission. |
| 3. Violation of privacy | c. Cyber stalking.  |
| 4. Internet time theft  | d. Purchasing goods using another person's bank account.            |

PS : CA

SI : 1 - c    2 - d                    3 - a                    4 - b

12. *LO: 12.6 Type: Short answer* *Score 2*

What is meant by 'Pornography'? Identify the ill effects of it.

PS : CA

SI : Correct definition of pornography - 1 Score. Identifying the most important ill effect - 1 score.

13. *LO: 12.8 Type: Short answer* *Score 2*

A person ordered for a mobile phone through online shopping and paid using electronic card. After a few days he got a packet containing some plastic toy phone and he was cheated. How can he fight against the company legally?

PS : CG

SI : Brief explanation about IT Act

14. *LO: 12.3 Type: Short answer* *Score 3*

What is meant by e-Banking? Write any two advantages.

PS : CA

SI : Definition of e-Banking - 1 Score, Advantages, any two - 2 Scores

15. *LO: 12.2, 12.3 Type: Short answer* *Score 3*

Rahul is a person who is very much interested in reading books. But, as part of his profession, he has to travel a lot daily by train or bus. Can you suggest a way to satisfy his need? Briefly explain.

PS : CG

SI : Yes, using e-Books - 1 Score, Correct explanations about electronic book reader - 2 Scores.

16. *LO: 12.2, 12.3 Type: Short answer Score 3*  
 Define e-Learning. Write briefly about any two tools used in e-Learning.  
 PS : CA  
 SI : Definition of e-Learning - 1 Score, Brief details about e-Learning tool - 2 Scores.
17. *LO: 12.3 Type: Short answer Score 2*  
 'Even though e-Business has many advantages, it is facing certain challenges also'. Justify this statement.  
 PS : CA  
 SI : Any four points about challenges in e-Business - 2 Scores.
18. *LO: 12.2 Type: Short answer Scores 2*  
 Compare e-Commerce and e-Business.  
 PS : CA  
 SI : Any two points - 1 Score each.
19. *LO: 12.6 Type: Short answer Score 3*  
 Write the three major categories of cyber crimes. Explain each briefly.  
 PS : CA  
 SI : Names of categories (cyber crime against individual, against property, against government) - ½ score each. For correct explanation/definition of each category - ½ score each.
20. *LO: 12.1, 12.2 Type: Short answer Score 3*  
 Explain the importance of e-Governance in the modern world. Give examples.  
 PS : CG  
 SI : Relevant points about e-Governance, advantages & challenges, example - 1 Score each.
21. *LO: 12.3 Type: Short answer Score 3*  
 Briefly explain the concept and working of EPS (Electronic Payment System).  
 PS : CA  
 SI : Minimum three points about EPS 1 Score each.
22. *LO: 12.7 Type: Short answer Score 3*  
 Creative works like music, literary works, inventions etc. must be protected from replicating or copying.

- i. Identify the name given to the legal protection a person gets from the Government.
- ii. What are the two categories of it? Explain briefly.

Process skill : CA

Scoring Indicator: i) Intellectual Property Rights - 1. Correct names (Industrial property rights and copy right) and explanation - 1 Score each.

23. *LO: 12.1. 12.2*                      *Type: Short answer*                      *Score 3*

Match the following.

| Column A   | Column B    | Column C                           |
|------------|-------------|------------------------------------|
| e-Learning | SDC         | e-Business                         |
| e-Banking  | VYAS        | e-Governance                       |
| G2G        | Smart cards | Time and place is not a constraint |

PS : CA

SI : e-Learning-VYAS-Time and Place not a constraint, e-Banking-Smart card-e-Business, G2G-SDC-e-Governance - 1 Score for each correct combination.

24. *LO: 12.6, 12.7, 12.8*                      *Type: Essay*                      *Score 5*

It is well known that cyber crimes are increasing day by day. Prepare an explanatory note about the measures to stop cyber crimes. As a student, how can you become part of this movement?

PS : CG

SI: Brief narration about cyber crimes, details of cyber laws, cyber ethics and IT Act. Valid view points from the student to stop cyber crimes.

25. *LO: 12.1 to 12.4*                      *Type: Essay*                      *Score 5*

'Various services of ICT help the society in many ways'. Justify the above statement.

PS : CG

SI : Brief description about ICT services. Any five valid points.

**Assessment Worksheet – 12.1**

1. Full form of ICT is \_\_\_\_\_.
2. Interface between Government and common citizens is called \_\_\_\_\_.
3. Name the three components of e-Governance structure.
4. SDC stands for \_\_\_\_\_.
5. The textual information available in electronic format is called \_\_\_\_\_.

**Assessment Worksheet – 12.2**

1. A challenge to e-Business is
  - a. Overcomes geographical limitations
  - b. Remains open all the time
  - c. No chance for touch and feeling advantage.
  - d. Reduces operational cost
2. Full form of CSC is \_\_\_\_\_.
3. G2E is an interaction in
  - a. e-Learning
  - b. e-Commerce
  - c. e-Business
  - d. e-Governance
4. Full form of KSWAN is \_\_\_\_\_.
5. Which one of the following websites is not an e-Business website?
  - a. [www.ignouonline.ac.in](http://www.ignouonline.ac.in)
  - b. [www.ebay.in](http://www.ebay.in)
  - c. [www.airindia.com](http://www.airindia.com)
  - d. [www.irctc.co.in](http://www.irctc.co.in)

**Assessment Worksheet - 12.3**

1. The name of an educational TV channel is \_\_\_\_\_.
2. Identify the name given to the computer network for implementing the e-Governance infrastructure.
3. Identify the ICT service to which the website www.spark.gov.in belongs.
  - a. e-Learning
  - b. e-Commerce
  - c. e-Governance
4. EPS stands for \_\_\_\_\_.
5. Which of the following is related to e-Business?
  - a. e-Text
  - b. e-Content
  - c. e-Banking
  - d. G2G

**Assessment Worksheet - 12.4**

1. Which of the following can be a cyber crime?
  - a. Blogging
  - b. e-mailing
  - c. Uploading
  - d. Phishing
2. Creating fake facebook accounts in the name of famous persons is a type of \_\_\_\_\_.
  - a. Identity theft
  - b. Harassment
  - c. Cheating
  - d. Privacy violation
3. Copying of another person's thoughts, ideas etc. and presenting them as one's own intellectual work is called \_\_\_\_\_.
4. Identify a cyber crime against the Government
  - a. Cyber terrorism
  - b. Internet time theft
  - c. Credit card fraud
5. Name the process of using scientific knowledge for identifying, collecting and presenting evidences of crimes in front of the court, related to Internet.

**GUIDELINES FOR LAB WORK AND PRACTICAL EVALUATION  
OF COMPUTER APPLICATIONS (COMMERCE)*****2014 - 15 Admission onwards***

We follow outcome focussed assessment approach in the evaluation process in the Kerala School Curriculum 2013. Term-end Evaluation is an important aspect of assessment. Along with Term-end Evaluation at the end of an academic year, Practical Evaluation (PE) is to be conducted. PE is the term-end assessment of the lab work done in the academic year. Lab work is an integral part of the Continuous and Comprehensive Evaluation (CCE). Hence, it should be considered for the process assessment and portfolio assessment which are the components of Continuous Evaluation (CE) score.

**A. Syllabus for Practical**

Lab work is a part of the transaction of certain contents in the syllabus. Students can attain the learning outcomes associated with some of the concepts/content only through the lab work. Hence the practical should begin in Class XI itself and it should go on with the respective theoretical aspects. Areas to be covered for the lab work and the minimum number of problems are given below:

- |                              |                      |
|------------------------------|----------------------|
| <b>1. Programming in C++</b> | <b>(10 problems)</b> |
| • If - else statements       | (1 problem)          |
| • switch statement           | (1 problem)          |
| • Looping statements         | (2 problems)         |
| • Array manipulation         | (2 problems)         |

- Functions (2 problems)
- Structures (1 problem)
- Pointers (1 problem)
- 2. Developing HTML documents (5 problems)**
  - Basic tags, <IMG> tag (1 problem)
  - Lists (1problem)
  - Hyper-linking (1 problem)
  - Table / Frame (1 problem)
  - Form (1 problem)
- 3. Client side programming with JavaScript in HTML codes (2 problems)**
  - Control structure (1 problem)
  - Data validation (1 problem)
- 4. Server side scripting with PHP (3 problems)**
  - PHP script using Forms (2 problems)
  - Database connectivity (1 problem)
- 5. Database queries using MySQL (5 problems)**
  - Five tables should be identified and queries should be designed in such a way that all clauses, operators and aggregate functions are to be covered.

### **B. Lab Work**

This is an activity by which, the concepts acquired and observations noted are practically implemented in the lab, and thereby, more clarity about the concepts and operational skills are achieved. The students should also be convinced about the use of computer for problem solving with the help of user developed programs. This activity makes the students utilise the computer to develop applications in various fields. The active participation and involvement of the students are to be ensured.

A minimum of 25 problems, as specified above, are to be solved through the lab work. Sample questions from each area are given as Appendix-1 of this document. The questions are grouped into three levels for each area, based on the difficulty level. While selecting the minimum required questions, we should ensure that, questions are chosen from all the three levels. The number of questions from each level should be in the ratio



5:3:2 for each area of the syllabus. A sample list of 25 problems as per the foresaid criteria is given as Appendix-2.

### **Practical Log Book**

Practical Log Book (PLB) is a standard record book in which all the activities related to lab work are recorded. A PLB is opened in Class XI for the lab work and the same is used in Class XII. Lab work is a continuous process. The PLB should contain a minimum of 25 works as specified in the practical syllabus. The format of recording in Practical Log Book may be as follows:

#### ***Programming in C++***

| <b>LHS page</b>  | <b>RHS page</b>   |
|--|---|
| <ul style="list-style-type: none"> <li>• Algorithm / Flowchart</li> <li>• Sample Input and Output</li> </ul> | <ul style="list-style-type: none"> <li>• Problem number and Date of practical work</li> <li>• Problem statement</li> <li>• Source Code</li> </ul> |

#### ***Web Applications (HTML documents, JavaScript)***

| <b>LHS page</b>  | <b>RHS page</b>   |
|--|---|
| <ul style="list-style-type: none"> <li>• Tags and attributes required</li> <li>• Printout of resultant web page</li> </ul> | <ul style="list-style-type: none"> <li>• Problem number and Date of practical work</li> <li>• Problem statement</li> <li>• HTML Code</li> </ul> |

#### ***Database queries using MySQL***

| <b>LHS page</b>  | <b>RHS page</b>  |
|--|--|
| <ul style="list-style-type: none"> <li>• Table with sample records</li> <li>• Output of queries</li> </ul> | <ul style="list-style-type: none"> <li>• Problem number and Date of practical work</li> <li>• Table structure and queries</li> <li>• SQL statements</li> </ul> |

The teacher should verify the correctness of each work and affix his/her signature along with date and remarks, if any.

### **Procedure**

The lab work consists of threefold procedure - preparatory work, tryout and reporting. Teachers should ensure that the students pass through all these three stages sequentially throughout the academic year.

**Preparatory work:** The student who comes to the computer lab to do practical work should be clear about the work he/she intends to do. He/She should also know the steps for doing the job using a computer, the software to be used, how it has to be operated, what the product should be, what should be its specifications and program code. All students should have their Practical Log Book while attending the lab period with the following details:

- Program number and date
- Problem statement
- Algorithm / Flowchart / Tags and attributes
- C++ source code/ HTML code / SQL statements

**Tryout:** In the case of C++ programming and web applications, the source code is typed, compiled and executed in the lab. During the debugging process, the corrections, if any, are noted down in the PLB also. When the output is obtained, it should be intimated to the teacher. Teacher performs process assessment and makes necessary recordings in both the PLB and Teacher's manual. Students record sample output in the PLB or take the printout of the output.

**Reporting:** The PLB with the final code and sample output (pasted printout in the case of web applications and office packages) is submitted and get it signed by the teacher before the next lab period.

The programs discussed in the class room are to be tried out in the lab. More problems are also available in the text book. Teacher is expected to ensure a minimum number of problems in the Practical Log Book covering all the areas suggested for practical evaluation. The prescribed proportion among the three groups should be strictly followed in the selection of questions.

### **C. Practical Evaluation (PE)**

The problem solving skills and the competency in using various software packages are to be assessed through PE. The following are the guidelines to be followed while conducting PE:

- The questions should strictly be from the prescribed syllabus.
- Examination will be of 3 hours duration and maximum score will be 40.
- Practical evaluation will be conducted in batches. The maximum number of students in each batch is limited to 15.

- Students must attend the PE with Practical Log Book. It should contain a minimum of 25 programs covering the practical syllabus as described earlier. Only one notebook is enough for the Practical Log Book (*no rough – fair separation*). Practical Log Book should be certified at the end of Class XI as well as Class XII by the teacher-in-charge. The same should be verified and signed by the external examiner.
- The questions are to be finalised from the pool issued by the DHSE referring to the PLB.
- There will be three parts in the question paper. Part A contains questions from Programming in C++. Part B contains questions for web applications from the respective syllabus and Part C includes questions for database queries. A candidate has to attend two questions – one from Part A and the other from either Part B or C whichever is assigned.
- There should be a minimum of 16 question papers for each batch of 15 students. Each Question paper should contain a question from Part A and another Question from Part B or C. While framing questions for each question paper, it should be noted that if the question from Part A requires more time due to its higher level, the second question from Part B or C should be of lower level and vice versa.
- One question paper will be selected by the student at random from a set of 16 Question papers. Appropriate strategy may be adopted by the examiner to ensure the fair conduct of examination.
- Once the learner is assigned the questions, he/she should write the source code/ procedure/statements for any one of the questions and submit it to the examiner. The examiner checks the correctness of the logic or procedure and allows doing it on the computer if found correct. If the logic or procedure is approximately 70% correct, some clues or hints may be given and the student is allowed to try on the computer. If the logic (or procedure) is wrong, the examiner can give another problem from the same area with the same level. The student may be allowed to change the question within half an hour, if the question is found unanswerable. In such cases, score should be deducted appropriately and may be changed within half an hour.
- The debugging skills are to be assessed and credit should be given.
- The accuracy in the output is to be tested with proper sample data.
- Delete programmes from system before exam and don't use help files.

- Teacher should ensure that the programs developed as part of lab work and by the previous candidates are deleted before the commencement of the examination.
- The students are not allowed to use the help files of the software.

*The score distribution for each question in C++ should be as follows:*

- |  |           |            |
|--|-----------|------------|
| • Logic of the solution<br>(Program coding)            | - 8 score | } 16 score |
| • Debugging skills<br>(Error correction and execution) | - 6 score |            |
| • Dynamic problem solving skills                       | - 2 score |            |

*The score distribution for each question in web application should be as follows:*

- |  |           |            |
|--|-----------|------------|
| • Proper tags and attributes<br>(Script if required)   | - 8 score | } 16 score |
| • Debugging skills<br>(Error correction and execution) | - 6 score |            |
| • Dynamic problem solving skills                       | - 2 score |            |

*The score distribution for each question in SQL should be as follows:*

- |  |           |            |
|--|-----------|------------|
| • Proper commands, clauses, operators, etc.            | - 8 score | } 16 score |
| • Debugging skills<br>(Error correction and execution) | - 6 score |            |
| • Dynamic problem solving skills                       | - 2 score |            |

*The score distribution for each question in Office packages should be as follows:*

- |  |            |            |
|--|------------|------------|
| • Procedure/Formula/<br>Menus & Commands/Tools | - 10 score | } 16 score |
| • Creativity and formatting ability            | - 4 score  |            |
| • Dynamic skill in using the software          | - 2 score  |            |

|                                    |            |            |
|------------------------------------|------------|------------|
| <b>Total score for 2 questions</b> | - 32 score | } 40 score |
| <b>Practical Log Book</b>          | - 4 score  |            |
| <b>Viva voce</b>                   | - 4 score  |            |

- Viva voce should not create sense of fear among the students. It should not be formal in the form of an interview. It should be a casual interaction with the students during the evaluation to check whether he/she has conceptual/process clarity in the given two questions only. The examiner may ask 4 to 6 questions to award the scores for viva voce.
- The mark-list of the students should be prepared, reflecting the split

scores along with the total score.

- The scores of the students are to be recorded in the mark sheet issued by the DHSE and send it to the DHSE as per the instructions given by the directorate.

Dynamic problem solving skills may be tested as follows:

- After completing the program, a slight modification in the problem can be made and let the learner modify the code to effect the change.
- The ability of the learner can be credited by awarding the 2 scores suitably.
- E.g.: If the original question is to find the largest among three numbers, ask to modify the code to find the smallest.

**Format of Score Sheet for Practical Evaluation**

| Sl. No. | Register Number | Qn. No. | Score Distribution          |                            |                    |                       |                        |                | Total Score (40) |
|---------|-----------------|---------|-----------------------------|----------------------------|--------------------|-----------------------|------------------------|----------------|------------------|
|         |                 |         | Logic / Procedure (8 or 10) | Execution/ Output (6 or 4) | Dynamic Skills (2) | Total for 2 Qns. (32) | Practical Log Book (4) | ViVa Voice (4) |                  |
| 1       |                 |         |                             |                            |                    |                       |                        |                |                  |
| 2       |                 |         |                             |                            |                    |                       |                        |                |                  |
| 3       |                 |         |                             |                            |                    |                       |                        |                |                  |
| 15      |                 |         |                             |                            |                    |                       |                        |                |                  |

Name and Designation of Examiner

.....  
 .....

Date of Exam: .....

Signature: .....

**APPENDIX – 1****Pool of Questions****Programming in C++ (10 x 3 = 30 questions)****Level 1**

1. Input the three coefficients of a quadratic equation and find the roots.
2. Input a group code and display the corresponding group name based on the following:
  - 5, 7 – Science (Computer Science)
  - 33, 34 – Humanities (Computer Applications)
  - 39 – Commerce (Computer Applications)
  - Other codes – Non Computer groups
3. Find the sum of the digits of an integer number.
4. Find the sum of the squares of the first N natural numbers.
5. Find the length of a string without using `strlen()` function.
6. Read admission number of N students in a class and search for a given admission number in the list. Use linear search method of searching.
7. Find the factorial of a number with the help of a user-defined function.
8. Define a function to swap the contents of the two variables. Using this function, interchange the values of three variables. E.g. AàBCàA.
9. Find the net salary of an employee by defining a structure with the details Employee Code, Name, Basic Pay, DA, HRA and PF.
10. Create two pointers, initialise with two numbers and find the sum and average of these numbers.

**Level 2**

1. Input three numbers and find the difference between the smallest and the largest numbers.
2. Assume that January 1 is Monday. Write a program using switch to display the name of the day in that month when we input day number.
3. Input a number and check whether it is palindrome or not.
4. Find all prime numbers below 100.

5. Display Pascal's triangle having N rows.
6. Read N numbers into an array and display the numbers larger than the average value.
7. Define a function to find the factorial of a number. Using this function find the value of nCr.
8. Input an integer number and display its binary equivalent with the help of a user-defined function.
9. With the help of a structure, develop a C++ program to read register number, name, and Scores obtained (out of 200) in English, second language, chemistry, physics, computer science and mathematics by 5 students. Calculate total score, average score and grade obtained by them. Grade is calculated based on the average as given in the table. Display register number, name, average score and grade of these students.
10. Input string into a character pointer and count the vowels in the string.

| Average Score | Grade    |
|---------------|----------|
| >=180         | A+       |
| >=160         | A        |
| >=140         | B+       |
| >=120         | B        |
| >=100         | C+       |
| >=80          | C        |
| >=60          | D+       |
| <60           | No Grade |

**Level 3**

1. Find the amount to be paid for the consumption of electricity when the previous and current meter-readings are given as input based on the conditions given in the table.
2. Find area of a rectangle, a circle and a triangle. Use **switch** statement for selecting an option from a menu.
3. Display the first N terms of Fibonacci series.
4. Input two years (e.g. 1000, 2000) and display all leap years between them.
5. Create an array to store the heights of some students and sort the values.

| Units consumed | Amount per Unit |
|----------------|-----------------|
| Up to 100      | Rs. 0.50/-      |
| 101 - 150      | Rs. 0.75/-      |
| 151 - 200      | Rs. 1.00/-      |
| 201 - 250      | Rs. 1.50/-      |
| Above 250      | Rs. 2.00/-      |

6. Create a square matrix and display the same in matrix form. Find the sum of leading diagonal elements (from top left to bottom right) and off diagonal elements (top right to bottom left) separately.
7. Find the sum of the first N natural numbers using recursive function.
7. Define a function to accept an integer number and return its reverse (e.g. if the argument is 123 the return-value should be 321). Using this function display all palindrome numbers between a given range.
8. Define a structure to store the details of books such as Book Code, Book Title, Date of Purchase, Author, Publisher and Price. Write a program with this structure to store the details of 10 books and display the details.
9. Create a dynamic array to store the names of a group of students and prepare a roll list according to the alphabetical order of the names.



**Web Applications (10 x 3 = 30 Questions)**  
**(HTML - 7, JavaScript - 2, PHP - 3)**

**Level 1**

1. Design a simple and attractive web page for Kerala Tourism. It should contain features like background colour/image, headings, text formatting and font tags, images, etc.
2. Design a web page as shown below using appropriate list tags.

**List of Nobel Laureates from India**

Rabindra Nath Tagore

He was the first to get Nobel Prize from India. He received prize in literature in 1921. He got Nobel Prize for his collection of poems “Gitanjali”.

C V Raman

He got Nobel for Physics in 1930. He received Nobel Prize for his contribution called Raman Effect.

Mother Teresa

Mother Teresa who founded Missionaries of Charity which is active in more than 100 countries received Nobel Prize in 1979.

Amartya Sen

Amartya Sen was awarded Nobel Prize in 1998 in Economics. He has made contributions to welfare economics, social choice theory etc.

Kailash Satyarthi

He is a child right activist who founded “Bachpan Bachao Andolan” in 1980. He shared Nobel prize for peace in 2014.

3. Design a personal web page for your friend. It should have a link to his e-mail address.
4. Design a web page containing a table as shown below.

**Terrestrial Planets (Source: NASA)**

| <b>Planet</b> | <b>Day Length<br/>(In Earth hours)</b> | <b>Year Length<br/>(In Earth days)</b> |
|---------------|--|--|
| Mercury       | 1408                                   | 88                                     |
| Venus         | 5832                                   | 224.7                                  |
| Earth         | 24                                     | 365.26                                 |
| Mars          | 25                                     | 687                                    |

5. Design a simple web page as shown below.

**Client Login**

Enter User Name

Enter your Password

6. Develop a web page with two text boxes and a button labelled “Show”. The user can enter a number in the first text box. On clicking the button, the second text box should display the sum of all numbers up to the given number. Write the required JavaScript.
7. A web page should contain one text box for entering a text. There should be two buttons labelled “To Upper Case” and “To Lower Case”. On clicking each button, the content in the text box should be converted to upper case or lower case accordingly. Write the required JavaScript for these operations.
8. Write a PHP program to accept the total sales of a particular salesman and display commission. If the monthly sales amount is greater than 1 lakh - commission is 10%, if it is between 1 lakh and 1.5 lakh - commission is 12% and if it is greater than 1.5 lakh - commission is 15%.
9. Write a PHP program to accept a number and display it in the following format. If 5 is the given, then the output will be as follows:
- ```

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

```
10. Write a data entry program in PHP which accepts the details of students like register number, name, age, sex and group (Commerce, Science, and Humanities) and stores it in a database.

### Level 2

1. Design a web page for promoting vegetable cultivation at homes as shown in the figure. It should contain features like background colour/ image, headings and stylish fonts, images, marquee, etc.



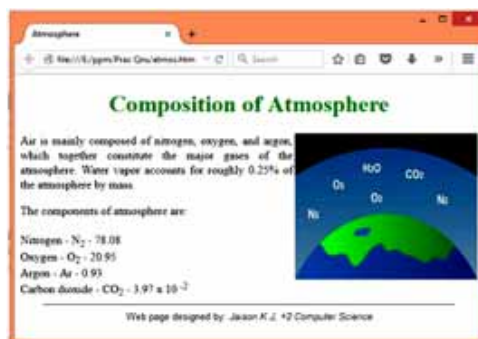
2. Design an attractive web page showing the following list.

#### Graduate Level Courses in Leading Institutions in Kerala

- Indian Institute of Technology, Palakkad
  - B.Tech.
- National Institute of Technology, Calicut
  - B.Tech.
  - B.Arch.
- Indian Institute of Science Education and Research, Thiruvananthapuram
  - BS-MS Dual Degree
- National University of Advanced Legal Studies, Kochi
  - B.A. LL.B. (Hons.)
- Indian Institute of Space Science and Technology
  - B.Tech. (Aerospace Engineering, Avionics)
  - Dual Degree (B.Tech. + M.S./M.Tech.)

### Level 3

1. Design a web page about atmosphere as shown below. It should contain features like background colour/image, headings and stylish fonts, images, etc.
2. Design a web page showing tourist destinations in Kerala as shown below.







## Department of Tourism

### Government of Kerala

#### *Tourist Destinations in Kerala*

1. Beaches
    - a. Kovalam
    - b. Muzhuppilangad
    - c. Kappad
  2. Hill Stations
    - i. Munnar
    - ii. Wayanad
    - iii. Gavi
  3. Wildlife
    - a. Iravikulam
    - b. Muthanga
    - c. Kadalundi
3. Design an attractive web page about India. Provide details about the Indian freedom movement at the lower part of the web page. Also create another web page containing the list of states in India, named 'states.htm'. Create two links in the main web page - one to link to the bottom of the web page where details about freedom movement is given and another to the web page 'states.htm'.
4. Design the following catalogue of products for an IT shop using HTML.

|                                                                                     |                                             |
|-------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Laser Printer</b>                                                                |                                             |
|  | Model: Canon LBP 2900<br>Price: Rs. 6500    |
| <b>Scanner</b>                                                                      |                                             |
|  | Model: HP Scanjet G2410<br>Price: Rs. 3800  |
| <b>Monitor</b>                                                                      |                                             |
|  | Model: LG 22MP67VQ<br>Price: Rs. 10500      |
| <b>Keyboard &amp; Mouse Combo</b>                                                   |                                             |
|  | Model: Logitech MK200 USB<br>Price: Rs. 950 |

5. Design an HTML form to accept the Curriculum Vita of a job applicant. The form should provide facility to accept name, address in multiple lines, gender using option button, nationality using a list box and hobbies using check boxes. The form should provide buttons to save and clear the contents of text boxes.
6. Develop a web page with two text boxes and a button labelled "Show". The user can enter a number in the first text box. On clicking the button, the second text box should display whether the number is prime or not. Write the required JavaScript.
7. Develop a web page containing a two text boxes for entering User name and Password. There should be a login button also. On clicking the login button, it should check the followings.
  - a) The user name should contain at least 10 characters and all the letters should be in lower cases.
  - b) The password should contain at least 7 characters and should contain at least one lower case letter, one upper case letter and a digit.
8. Write a PHP program to accept a number and display its multiplication table up to 12 in a neat table format.
9. Write a PHP program to select a country from combo box and display its capital. (Country and capital may be stored in an associative array.)
10. Write a PHP program to accept User Id and password and check whether it is valid or not. If it is correct then display the message "Successfully Logged In" else display the message "Invalid User Id or Password". (The User Id and password are to be stored in a table in a database and accessed from the PHP program.)

**SQL (5 x 3 = 15 Questions)****Level 1**

1. Create a table Student with the following fields and insert at least 5 records into the table except for the column Total.

|             |              |             |
|-------------|--------------|-------------|
| Roll_Number | Integer      | Primary key |
| Name        | Varchar (25) |             |
| Batch       | Varchar (15) |             |
| Mark1       | Integer      |             |
| Mark2       | Integer      |             |
| Mark3       | Integer      |             |
| Total       | Integer      |             |

- Update the column Total with the sum of Mark1, Mark2 and Mark3.
  - List the details of students in Commerce batch.
  - Display the name and total marks of students who are failed (Total < 90).
  - Display the name and batch of those students who scored 90 or more in Mark1 and Mark2.
  - Delete the student who scored below 30 in Mark3.
2. Create a table Employee with the following fields and insert at least 5 records into the table except the column Gross\_pay and DA.

|             |                |             |
|-------------|----------------|-------------|
| Emp_code    | Integer        | Primary key |
| Emp_name    | Varchar (20)   |             |
| Designation | Varchar (25)   |             |
| Department  | Varchar (25)   |             |
| Basic       | Decimal (10,2) |             |
| DA          | Decimal (10,2) |             |
| Gross_pay   | Decimal (10,2) |             |

- Update DA with 75% of Basic.
- Display the details of employees in Purchase, Sales and HR departments.
- Update the Gross\_pay with the sum of Basic and DA.
- Display the details of employee with gross pay below 10000.
- Delete all the clerks from the table.

3. Create a table *Stock*, which stores daily sales of items in a shop, with the following fields and insert at least 10 records into the table.

|                   |                |             |
|-------------------|----------------|-------------|
| Item_code         | Integer        | Primary key |
| Item_name         | Varchar (20)   |             |
| Manufacturer_Code | Varchar (5)    |             |
| Qty               | Integer        |             |
| Unit_Price        | Decimal (10,2) |             |
| Exp_Date          | Date           |             |

- Display the details of items which expire on 31/3/2016.
  - Display the item names with stock zero.
  - Remove the items which expire on 31/12/2015.
  - Increase the unit price of all items by 10%.
  - List the items manufactured by "ABC & Co" with quantity above 100.
4. Create a table *Book* with the following fields and insert at least 5 records into the table.

|             |                |             |
|-------------|----------------|-------------|
| Book_ID     | Integer        | Primary key |
| Book_Name   | Varchar (20)   |             |
| Author_Name | Varchar (25)   |             |
| Pub_Name    | Varchar (25)   |             |
| Price       | Decimal (10,2) |             |

- Display the details of books with price 100 or more.
  - Display the Name of all the books published by SCERT.
  - Increase the price of the books by 10% which are published by SCERT.
  - List the details of books with the title containing the word "Programming" at the end.
  - Remove all the books written by "Balaguruswamy".
5. Create a table *Bank* with the following fields and insert at least 5 records into the table.

|             |                |             |
|-------------|----------------|-------------|
| Acc_No      | Integer        | Primary key |
| Acc_Name    | Varchar (20)   |             |
| Branch_Name | Varchar (25)   |             |
| Acc_Type    | Varchar (10)   |             |
| Amount      | Decimal (10,2) |             |

- a. Display the account details of "Savings Account" in Kodungallur branch.
- b. Change the branch name "Trivandrum" to "Thiruvananthapuram".
- c. Display the details of customers in Thiruvananthapuram, Ernakulam and Kozhikode.
- d. List the details of customers in Thrissur branch having a minimum balance of Rs. 5000.
- e. Delete all the current accounts in Mahe branch.

**Level 2**

1. Use Student table and write SQL statements for the following:
  - a. Update the column Total with the sum of Mark1, Mark2 and Mark3.
  - b. List the details of students in Science batch in the ascending order of their names.
  - c. Display the highest Total in Humanities batch.
  - d. List the details of students who passed (Subject minimum is 30 and aggregate minimum is 90) the course.
  - e. Delete the students of Commerce batch who failed in any one subject.
2. Use Employee table and write SQL statements for the following:
  - a. Update DA with 75% of Basic for Managers and 80% Basic for all other employees.
  - b. Update the Gross\_pay with the sum of Basic and DA
  - c. Display the details of employees in Purchase, Sales and HR departments in descending order of Gross pay.
  - d. Find the number of employees in Accounts department.
  - e. Delete the details of clerks whose Gross pay is below 5000.
3. Use Stock table and write SQL statements for the following:
  - a. Display the details of items which expire after 31/3/2016 in the order of expiry date.
  - b. Find the number of items manufactured by the company "SATA".
  - c. Remove the items which expire between 31/12/2015 and 01/06/2016.
  - d. Add a new column named Reorder in the table to store the reorder level of items.



- e. Update the column Reorder with value obtained by deducting 10% of the current stock.
4. Use Book table and write SQL statements for the following:
    - a. Insert a column named Number\_of\_pages into the table.
    - b. Display the details of books of the same author together in the descending order of the price published by NCERT.
    - c. Display the average price of books published by "BPB" and written by "Robert Lafore".
    - d. List the details of books published by "PHI" that contains the word "Programming" in the title.
    - e. Remove all the books written by "Balaguruswamy", "Kanetkar" or "Robert Lafore".
  5. Use Bank table and write SQL statements for the following:
    - a. Display the branch-wise details of account holders in the ascending order of the amount.
    - b. Insert a new column named Minimum\_Amount into the table with default value 1000.
    - c. Update the Minimum\_Amount column with the value 1000 for the customers in branches other than Alappuzha and Malappuram.
    - d. Find the number of customers who do not have the minimum amount 1000.
    - e. Remove the details of SB accounts from Thiruvananthapuram branch who have zero (0) balance in their account.

### Level 3

1. Use Student table and write SQL statements for the following:
  - a. Update the column Total with the sum of Mark1, Mark2 and Mark3.
  - b. Add a new column Average to the table Student.
  - c. Update the column Average with average marks.
  - d. List the details of student who has the highest Total.
  - e. Delete the students of Commerce batch who failed in any two subjects.
2. Use Employee table and write SQL statements for the following:
  - a. Update DA with 75% of Basic for Managers and 80% of Basic for all other employees.

- b. Update the Gross\_pay with the sum of Basic and DA.
  - c. Display name, department and gross pay of employees in Purchase, Sales and HR departments. The employees in the same department should appear together in the ascending order of Gross pay.
  - d. Find the number of employees in each department where there is minimum of 5 employees.
  - e. Show the details of employee with Gross pay greater than the average gross pay.
3. Use Stock table and write SQL statements for the following:
  - a. Display the number of items manufactured by each company which expire after 31/3/2016.
  - b. Add a new column Reorder in the table to store the reorder level of items.
  - c. Update the column Reorder with value obtained by deducting 10% of the current stock.
  - d. Display the details of items which expire at last.
  - e. Remove the items which expire before 01/03/2015 or that are manufactured by "ABC & Co".
4. Use Book table and write SQL statements for the following:
  - a. Create a view containing the details of books published by SCERT.
  - b. Display the average price of books published by each publisher.
  - c. Display the details of book with the highest price.
  - d. Display the publisher and number of books of each publisher in the descending order of the count.
  - e. Display the title, current price and the price after a discount of 10% in the alphabetical order of book title.
5. Use Bank table and write SQL statements for the following:
  - a. Display the number and total amount of all the account holders in each branch.
  - b. Display the number of Savings Bank account holders in each branch.
  - c. Display the details of customers with the lowest balance amount.
  - d. Display the branch and number of Current accounts in the descending order of the count.
  - e. Display the details of customers in Kozhikode branch whose amount is greater the average amount.

## APPENDIX – 2

## Sample List of Questions for Lab Work

## Programming in C++ – 10 Qns. (L1 – 5, L2 – 3, L3 – 2)

1. 1. Input the three coefficients of a quadratic equation and find the roots. (L1)
2. Find area of a rectangle, a circle and a triangle. Use switch statement for selecting an option from a menu. (L3)
3. Find the sum of the digits of an integer number. (L1)
4. Find the sum of the squares of the first N natural numbers. (L1)
5. Find the length of a string without using strlen() function. (L1)
6. Read admission number of N students in a class and search for a given admission number in the list. Use linear search method of searching. (L1)
7. Define a function to find the factorial of a number. Using this function find the value of nCr. (L2)
8. Input an integer number and display its binary equivalent with the help of a user-defined function. (L2)
9. Define a structure to store the details of books such as Book Code, Book Title, Date of Purchase, Author, Publisher and Price. Write a program with this structure to store the details of 10 books and display the details. (L3)
10. Input string into a character pointer and count the vowels in the string. (L2)

## Web Applications – 10 Qns. (L1 – 5, L2 – 3, L3 – 2)

1. Design a simple and attractive webpage for Kerala Tourism. It should contain features like background colour/image, headings, text formatting and font tags, images, etc. (L1)
2. Design a webpage as shown below using appropriate list tags. (L2)

### List of Nobel Laureates from India

Rabindra Nath Tagore

He was the first to get Nobel Prize from India. He received prize in literature in 1921. He got Nobel Prize for his collection of poems "Gitanjali".

C V Raman

He got Nobel for Physics in 1930. He received Nobel Prize for his contribution called Raman Effect.

Mother Teresa

Mother Teresa who founded Missionaries of Charity which is active in more than 100 countries received Nobel Prize in 1979.

Amartya Sen

Amartya Sen was awarded Nobel Prize in 1998 in Economics. He has made contributions to welfare economics, social choice theory etc.

Kailash Satyarthi

He is a child right activist who founded "Bachpan Bachao Andolan" in 1980. He shared Nobel prize for peace in 2014.

3. Design a simple webpage about your school. Create another webpage named address.htm containing the school address. Give links from school page to address.htm. (L2)
4. Design a webpage containing frames that divide the screen vertically in the ratio 50:50. Design two web pages - one containing the list of Indian cricket team members and the second page containing a list of Indian football team members. (L2)
5. Design an HTML form to accept the Curriculum Vita of a job applicant. The form should provide facility to accept name, address in multiple lines, gender using option button, nationality using a list box and hobbies using check boxes. The form should provide buttons to save and clear the contents of text boxes. (L3)
6. Develop a webpage with two text boxes and a button labelled "Show". The user can enter a number in the first text box. On clicking the button, the second text box should display the day corresponding to the given number using switch statement in JavaScript. (1 - Sunday, 2 - Monday, ....., 7 - Saturday) (L2)
7. A webpage should contain one text box for entering a text. There should be two buttons labelled "To Upper Case" and "To Lower Case". On clicking each button, the content in the text box should be

converted to upper case or lower case accordingly. Write the required JavaScript for these operations. (L1)

8. Write a PHP program to accept the total sales of a particular salesman and display commission. If the monthly sales amount is greater than 1 lakh - commission is 10%, if it is between 1 lakh and 1.5 lakh - commission is 12% and if it is greater than 1.5 lakh - commission is 15%. (L1)
9. Write a PHP program to accept a number and display it in the following format. If 5 is given, then output will be as follows:

```

1
2   2
1   2   3
1   2   3   4
1   2   3   4   5
    
```

(L1)

10. Write a PHP program to accept User Id and password and check whether it is valid or not. If it is correct then display the message "Successfully Logged In" else display the message "Invalid User Id or Password". (The User Id and password are to be stored in a table in a database and accessed from the PHP program) (L3)

**SQL – 5 Qns. (L1 – 2, L2 – 2, L3 – 1)**

1. Create a table Student with the following fields and insert at least 5 records into the table except for the column Total. (L1)

|             |              |             |
|-------------|--------------|-------------|
| Roll_Number | Integer      | Primary key |
| Name        | Varchar (25) |             |
| Batch       | Varchar (15) |             |
| Mark1       | Integer      |             |
| Mark2       | Integer      |             |
| Mark3       | Integer      |             |
| Total       | Integer      |             |

- a. Update the column Total with the sum of Mark1, Mark2 and Mark3.
- b. List the details of students in Commerce batch.
- c. Display the name and total marks of students who are failed (Total < 90).

- d. Display the name and batch of those students who scored 90 or more in Mark1 and Mark2.
- e. Delete the student who scored below 30 in Mark3.
2. Create a table Employee with the following fields and insert at least 5 records into the table except the column Gross\_pay and DA. (L1)

|             |                |             |
|-------------|----------------|-------------|
| Emp_code    | Integer        | Primary key |
| Emp_name    | Varchar (20)   |             |
| Designation | Varchar (25)   |             |
| Department  | Varchar (25)   |             |
| Basic       | Decimal (10,2) |             |
| DA          | Decimal (10,2) |             |
| Gross_pay   | Decimal (10,2) |             |

- a) Update DA with 75% of Basic.
- b) Display the details of employees in Purchase, Sales and HR departments.
- c) Update the Gross\_pay with the sum of Basic and DA.
- d) Display the details of employee with gross pay below 10000.
- e) Delete all the clerks from the table.
3. Create a table Stock, which stores daily sales of items in a shop, with the following fields and insert at least 10 records into the table. (L2)

|                   |                |             |
|-------------------|----------------|-------------|
| Item_code         | Integer        | Primary key |
| Item_name         | Varchar (20)   |             |
| Manufacturer_Code | Varchar (5)    |             |
| Qty               | Integer        |             |
| Unit_Price        | Decimal (10,2) |             |
| Exp_Date          | Date           |             |

- a. Display the details of items which expire after 31/3/2016 in the order of expiry date.
- b. Find the number of items manufactured by the company "SATA".
- c. Remove the items which expire between 31/12/2015 and 01/06/2016.
- d. Add a new column named Reorder in the table to store the reorder level of items.

- e. Update the column Reorder with value obtained by deducting 10% of the current stock.
4. Create a table Book with the following fields and insert at least 5 records into the table. (L3)

|             |                |             |
|-------------|----------------|-------------|
| Book_ID     | Integer        | Primary key |
| Book_Name   | Varchar (20)   |             |
| Author_Name | Varchar (25)   |             |
| Pub_Name    | Varchar (25)   |             |
| Price       | Decimal (10,2) |             |

- a. a. Create a view containing the details of books published by SCERT.
- b. Display the average price of books published by each publisher.
- c. Display the details of book with the highest price.
- d. Display the publisher and number of books of each publisher in the descending order of the count.
- e. Display the title, current price and the price after a discount of 10% in the alphabetical order of book title.
5. Create a table Bank with the following fields and insert at least 5 records into the table. (L2)

|             |                |             |
|-------------|----------------|-------------|
| Acc_No      | Integer        | Primary key |
| Acc_Name    | Varchar (20)   |             |
| Branch_Name | Varchar (25)   |             |
| Acc_Type    | Varchar (10)   |             |
| Amount      | Decimal (10,2) |             |

- a. Display the branch-wise details of account holders in the ascending order of the amount.
- b. Insert a new column named Minimum\_Amount into the table with default value 1000.
- c. Update the Minimum\_Amount column with the value 1000 for the customers in branches other than Alappuzha and Malappuram.
- d. Find the number of customers who do not have the minimum amount 1000.
- e. Remove the details of SB accounts from Thiruvananthapuram branch who have zero (0) balance in their account.