3

Components of the Computer System

Introduction

This unit at the beginning provides the learners with basic knowledge of data processing and the various functional units involved in the process of data processing. At this stage the learner should be able to describe the role of each functional unit and their importance in processing. In the next stage the hardware used for each functional units like processors, memory, input devices and output devices are to be discussed in detail. As a result the learner will be able to distinguish them based on their uses and features. The next section e-Waste provides the learners, knowledge of what is e-Waste, its hazards and its disposal methods. It also discusses the role of students in e-Waste disposal. This section should be handled with great importance as it could improve the morale and good attitudes in learners. This unit also discusses the concept of green computing with stress on how to make computers green. In the software section the learners are to be provided with knowledge of system software and application software in detail. Provision should be given for hands on experience on various software packages and utilities. The concept of free and open source software and proprietary software, freeware, shareware and human-ware are also discussed for analysis and interpretation by the learners.

Values and Attitudes

- ✓ Ability to solve problems of life with innovative ideas and utilize the experience for the benefit of the society.
- ✓ Judges the environmental and health hazards due to e-Waste and appraises the need of e-Waste disposal.
- ✓ Appraises the energy star concept and becomes a promoter of green computing.
- ✓ Ability to judge the pros and cons of free software and proprietary software.

Unit Frame

Period : 35

Concept / Idea and Process skills	Process/Activities with Assessments	Learning outcomes
• Hardware ✓ Observing ✓ Understanding ✓ Classifying ✓ Analysing	A discussion followed by a power point presentation of various components of computer system. Demonstration of actual motherboard with processor and memory. Assignment on input/output devices. Demonstration of available devices. Illustration, Table preparation, *Assessment:* Worksheet Self check questions	Identifies microprocessor and lists registers. Distinguishes various types of memory and lists their importance. Distinguishes different types of input/output devices based on their uses and features.
• e-Waste & Green Computing ✓ Understands ✓ Identifies ✓ Interprets ✓ Judges	General discussion on Green computing concepts. Discussion on steps that can be adopted to make computers green. Demonstration of various settings available in computer to make computer green. Illustration, Preparation of notes.	Recognises the importance of e-Waste disposal and the learner's role in its disposal. Explains the concept of green computing
• Software ✓ Understanding ✓ Classifying ✓ Discussing ✓ Identifying ✓ Categorizing	General discussion on software and its classification. Discussion on operating system and its functions. Demonstration of different operating systems. Discussion on different application software. Demonstration of different application software. Discussion on Computer languages. Demonstration of compilation/ interpretation process.	Distinguishes between system software and application software Recognises the need and functions of an operating system. Classifies various language processors and recognise their need. Lists the uses of different types of utility software.

Concepts/Process skills	Process/Activities with Assessments	Learning outcomes
	Discussion on utility software. A group discussion on free and open source software is conducted. A group discussion is conducted to list the different free and open source software. Discussion on freeware and shareware. Comparison between freeware and shareware with suitable examples Conducts a debate on open source and free software with proprietary software. Table preparation *Assessment:* Lab work Preparation of questions Preparation of notes	Distinguishes and lists the use of word processor, electronic spread sheets and presentation software. Explains the importance of open source concepts Distinguishes between freeware, shareware and proprietary software. Lists the advantages of freeware and shareware.
• Humanware or Liveware. ✓ Identifying ✓ Interpreting ✓ Concluding	General discussion on humanware or liveware. Classification of humanware with job description. Illustration, Preparation of notes	Explains the term humanware or liveware.

Towards the Unit:

Computer Memory

(1 Period)

Suggested activity: Seminar

- The teacher divides the students into 5 groups and each group is given task of presenting a seminar on different types of memory..
- Each group has to prepare a presentation on the type of memory assigned
- The seminar should
  - o list registers/primary memory/secondary memory and their uses.
  - o differentiate between functions of registers, primary and secondary memory.
  - o illustrate the need for registers and cache memory.
  - o compare the cost of different memories.
- The students in other group can clear their doubts after the seminar. The teacher is expected to support the presenter with additional information, if needed.
- This activity ensures the involvement of each student in the group for the activity and helps teachers to evaluate the involvement of each student in the group for process assessment.
- The teacher concludes the seminar pointing to the advantage and disadvantage of using different types of memory.
- Each student in a group has to submit the seminar report for the portfolio.

Inout Output Devices

(1 Period)

***Suggested activity: Assignment* on input/output devices**

- The teacher after completing general discussion on input/output devices, learners are asked to write an assignment.
- Different problems are given for each student or groups of three or five students.
  - o Each group is given the name of an office/shop/institution. (For example bank, supermarket, school, studio etc.)

- Each group has to
  - list the input/output devices needed by the office/shop/ institution.
  - justify the purpose of selecting the devices.
  - illustrate their functioning.
- Assignment is prepared in the Activity log book. The same may be collected in digital form prepared using word processing software. The product may be submitted through e-mail or print-out. This ensures the ICT skills of the learners.

e-Waste

(1 Period)

Suggested activity: General discussion and preparation of notes on green computing

- The teacher writes the following statement on blackboard or a chart.
  - "Many of the technologies we use every day consume more power and resources than they really need".
  - Learners are asked to analyse the statement and a discussion is done.
- The teacher writes the following statement on blackboard or a chart.
  - Should we use recyclable materials for manufacturing computer key board or cabinet? Why?
  - Learners are asked to analyse the statement and a discussion is done.
- Then the teacher discusses the concept of green computing and the learners recognise the importance of green computing and prepare notes on it.

Freeware and Shareware

(1 Period)

Suggested activity: Debate and preparation of notes.

- The teacher after discussing what is freeware and shareware/ proprietary software, initiates a debate whether freeware and shareware / proprietary software is better.

- The two sides of the class list out the advantages and disadvantages.

- This activity requires the involvement of all students in the class.
- The teacher concludes the discussion with the following points
  - Lists out the advantages and disadvantages
  - Instructs the students to prepare notes.

Process Assessment

- Group discussion on various components of computer.
- Seminar on memory.
- Assignment on input/output devices
- Group discussion on various types of software
- Debate on free and proprietary software.

Portfolio Assessment

- Activity log book
- Assignment
- Seminar report
- Assessment worksheets

Unit-wise Assessment

- Class test
- Quiz
- Question preparation

TE Questions

1. Pick the odd one out
   a) Hard Disk b) DVD c) RAM d) Floppy disk
2. What will happen if RAM is not present in the computer?
3. What will happen if ROM is not present in the computer?
4. Raju is planning to set up a DTP centre. Suggest a suitable printer for him with justification.

4. Match the following:

A	B
RAM	Interface between user and hardware
OMR	Heat sensitive paper
Operating System	Objective type Exam
Thermal printer	BIOS
ROM	Volatile

6. Suggest suitable devices for the following situations:
   a) To use in super markets for identifying products which make billing easier?
   b) To capture information, like pictures or text, and convert into a digital format that can be edited using computer.
7. What is the need for a compiler / interpreter?
8. What is e-Waste? Explain its disposal methods.
9. Explain student's role in e-Waste management.
10. Can the computer go green? How?
11. A computer after continuous use for two to three years became slightly slow? Point out a reason that can be associated with hard disk and give a suitable remedy?
12. How can we protect a computer from virus?
13. Classify the following softwares into groups and name the groups?

    MS word, Windows XP, Open office, Pascal, MS Excel, Winrar, Linux, C++, MySQL, Adobe Flash, Winzip
14. Can a computer function without an operating system? Why?
15. Among free software, open source software and proprietary, which is better? Why?
16. Distinguish freeware and shareware.
17. List any three humanware with job description?

Scoring Indicators

1. RAM
2. Computer becomes slower.
3. Problem with loading OS.
4. Laser Printer, 2 Justification points
5. RAM- Volatile, OMR- Objective type Exam, Operating System- Interface between user and hardware, Thermal printer- Heat sensitive paper, ROM- BIOS
6. a. Barcode reader, b. scanner and OCR.
7. Conversion from HLL to Machine language.
8. Definition, 3 disposal methods
9. Recycle, Reuse, stop buying unnecessary equipments, visit manufacturers website before buying
10. Yes; two supporting points.
11. Defragmentation and its definition
12. Antivirus software; Two Software names
13. Classify under System software and Application software
14. No, Process, device, memory and file management is done by OS.
15. Selection with justification.
16. Any two points
17. Any three humanware.

Assessment Worksheet 2.1

1. EEPROM stands for _____.
2. An example of optical storage device is _____.
3. Compare RAM and ROM.
4. List any three input devices
5. _____ holds the address of the next instruction to be executed by the processor

Assessment Worksheet 2.2

1. What is e-Waste?
2. List the toxic materials present in e-Waste.
3. The study and practice of environmentally sustainable computing is called _____.
4. One of the earliest initiatives towards green computing was the voluntary labeling program known as _____.
5. What is incineration?What do you mean by 'Green design'?

Assessment Worksheet 2.3

1 The interface between user and computer hardware is called ___.

2. List any two functions of operating system.
3. Match the following:

A	B
Language processor	Disk defragmenter
Utility software	Linux
High level language	Compiler
Operating system	Humanware
Database Administrator	C

4. An example of free and open source software is _____.
5. An example of proprietary software is _____.
6. What is Humanware? Give an example.