

**Vocational Higher Secondary
Education (VHSE)**

Second Year

MANAGEMENT

Reference Book - Teachers' Version



Government of Kerala
Department of Education

State Council of Educational Research and Training (SCERT),
KERALA
2016

Foreword

Dear Teachers

This reference book (**Teachers' Version**) is intended to serve as a transactional aid to facilitate classroom transaction and as a ready reference for teachers of Vocational Higher Secondary Schools. It offers some guidelines for the transaction of the course content and for undertaking the practical work listed in the course content. As the curriculum is activity based, process oriented and rooted in constructivism focusing on the realisation of learning outcomes, it demands higher level proficiency and dedication on the part of teachers for effective transaction.

In the context of the Right- based approach, quality education has to be ensured for all learners. The learner community of Vocational Higher Secondary Education in Kerala should be empowered by providing them with the best education that strengthens their competences to become innovative entrepreneurs who contribute to the knowledge society. The change of course names, modular approach adopted for the organisation of course content, work-based pedagogy and the outcome focused assessment approach paved the way for achieving the vision of Vocational Higher Secondary Education in Kerala. The revised curriculum helps to equip the learners with multiple skills matching technological advancements and to produce skilled workforce for meeting the demands of the emerging industries and service sectors with national and global orientation. The revised curriculum attempts to enhance knowledge, skills and attitudes by giving higher priority and space for the learners to make discussions in small groups, and activities requiring hands-on experience.

The SCERT appreciates the hard work and sincere co-operation of the contributors of this book that includes subject experts, industrialists and the teachers of Vocational Higher Secondary Schools. The development of the teachers' version of reference books has been a joint venture of the State Council of Educational Research and Training (SCERT) and the Directorate of Vocational Higher Secondary Education.

The SCERT welcomes constructive criticism and creative suggestions for the improvement of the book.

With regards,

Dr. J. Prasad
Director
SCERT, Kerala

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9. Index Numbers

Reference

About the Course

Management is a developing discipline. It ensures the accomplishment of the objectives of an organization within a set of constraints in scientific manner. Being the budding entrepreneurs, vocational higher secondary learners get ample knowledge, skills and attitudes on various aspects of management. The subject Management is introduced in VHSE as part of the commerce education in all commerce based vocational courses. It helps learners to acquaint with different management concepts and their application in business. Learners are also being introduced to certain tools for managerial decisions making from Economics and Statistics.

Learners have acquired the basic concepts of management, its process, functions, objectives and its functional areas, recent trends and certain tools from economics and statistics used in managerial decision making during the first year. In the second year, as a continuation of what they have studied, the economic environment for managerial decision making and the areas of short term and long term financial decision making, functional areas of management like production and operations management and quality management are included. More areas from Statistics like averages, dispersion, correlation and index numbers which are inevitable tools for managerial decision making are also included in the syllabus.

Learning Outcomes of the Course

The learner;

1. Develops an understanding about the concept, management.
2. Synchronizes the stages of evolution of management.
3. Recognizes the various areas where management concepts are applied.
4. Identifies the recent trends in management.
5. Identifies the importance of decision making in management.
6. Recognizes the role of economics in managerial decision making.
7. Analyses the various concepts of economics and relate them to decision making process.
8. Distinguishes between different types of pricing decision.
9. Recognizes the role of statistics in managerial decision making.
10. Converts the data into diagrams, graphs and charts.
11. Identifies the various components of economic environment.
12. Substantiates the concepts, economic systems, policies and national income.
13. Distinguishes between short term and long term decision making.
14. Identifies short term decisions in working capital management.
15. Infers long term managerial decisions.
16. Relate Capital budgeting to long term decision making.
17. Compare and contrast various capital budgeting techniques.
18. Distinguishes between production and operation management.
19. Classify the decisions in Production Management.
20. Recognizes the importance of Master Production Schedule.
21. Identifies the importance of quality management.
22. Interprets the term ISO 9000-2000
23. Identifies the significance of averages in managerial decision making.
24. Solves simple problems of average.
25. Develop an understanding about the type of averages suitable in a particular situation.
26. Examines the reliability of averages.
27. Relates between variables by measuring correlation.
28. Recognizes the application of indices in managerial decision making.

SYLLABUS

Unit I ECONOMIC ENVIRONMENT FOR MANAGEMENT (26 Periods)

- 1.1. Economic environment – Meaning and Significance
- 1.2. Basic concepts in Economic Environment
 - 1.2.1. National Income: Gross Domestic Product, Net Domestic Product, Gross National Product, Net National Product
 - 1.2.1.1. Methods of Measuring National Income
 - Value Added Method - Income Method - Expenditure Method
 - 1.2.1.2. Problems in the calculation of National Income
 - 1.2.2. Business Cycle - Phases of Business Cycle

Unit II WORKING CAPITAL MANAGEMENT (22 Periods)

- 2.1 Meaning and Concept of Working Capital
- 2.2 Components of Working Capital
- 2.3 Types of Working Capital
- 2.4 Meaning and significance of working capital management
- 2.5 Approaches to working capital Management

Unit III LONG RUN INVESTMENT DECISION - CAPITAL BUDGETING (24 Periods)

- 3.1. Meaning and Importance of Capital Budgeting
- 3.2. Capital Budgeting Process
- 3.3. Methods of Capital Budgeting – Traditional (Non- Discounted Cash Flow Methods)
 - 3.3.1. Pay Back Method
 - 3.3.2 Average Rate of Return Method
- 3.4. Methods of Capital Budgeting – Discounted Cash Flow Methods
 - 3.4.1. Net Present Value Method
 - 3.4.2. Profitability Index Method
 - 3.4.3. Internal Rate of Return Method

Unit IV PRODUCTION AND OPERATIONS MANAGEMENT (22 Periods)

- 4.1. Meaning and importance of production and operations management.
- 4.2. Difference between production and operation
- 4.3. Major decisions of production management
- 4.4. Plant location and factors affecting plant location
- 4.5. Plant layout and different types of plant layouts
- 4.6. Aggregate planning – meaning, importance and strategies
- 4.7. Master Production Scheduling - meaning, significance and development of Master Production Schedule (MPS)

Unit V QUALITY MANAGEMENT (16 Periods)

- 5.1. Meaning and definition of quality
- 5.2. Dimensions of quality – product and service
- 5.3. Meaning and concept of Quality Management
- 5.4. Principles of Quality Management
- 5.3. Quality systems
 - 5.3.1. Elements
 - 5.3.2. ISO 9000:2000

Unit VI MEASURES OF CENTRAL TENDENCY (32 Periods)

- 6.1. Meaning and Significance of Central Tendency
- 6.2. Qualities of a good average
- 6.3. Types of average
- 6.4. Simple Arithmetic Mean – individual observation, discrete series, continuous series.
- 6.5. Weighted Arithmetic Mean
- 6.6. Combined Arithmetic Mean

- 6.7. Correction in mean
- 6.8. Median - individual observation, discrete series, continuous series.
- 6.9. Determination of median graphically.
- 6.10. Partition Values – Quartiles, Deciles and Percentiles
- 6.11. Quartiles - individual observation, discrete series, continuous series.
- 6.12. Percentiles - individual observation, discrete series, continuous series.
- 6.13. Mode - individual observation, discrete series, continuous series.
- 6.14. Locating mode graphically
- 6.15. Comparison of mean, median and mode

Unit VII MEASURES OF DISPERSION (28 Periods)

- 7.1. Meaning and significance of measures of dispersion.
- 7.2. Methods of studying dispersion.
- 7.3. Absolute and relative measures of dispersion.
- 7.4. Range - individual observation, discrete series, continuous series.
- 7.5. Coefficient of Range.
- 7.6. Quartile Deviation - individual observation, discrete series, continuous series.
- 7.7. Co efficient of Quartile Deviation
- 7.8. Mean Deviation - individual observation, discrete series, continuous series.
- 7.9. Co efficient of Mean Deviation
- 7.10. Standard Deviation - individual observation, discrete series, continuous series.
- 7.11. Co efficient of Standard Deviation/Variance
- 7.12. Qualities of a good measure of dispersion.

Unit VIII CORRELATION (18 Periods)

- 8.1. Meaning of Correlation
- 8.2. Types of Correlation
 - 8.2.1. Simple, partial and multiple
 - 8.2.2. Positive and negative
 - 8.2.3. Perfect and imperfect
 - 8.2.4. Linear and non linear
- 8.3. Methods of studying correlation
 - 8.3.1. Scatter Diagram method
 - 8.3.2. Pearson's Co-efficient of Correlation
 - 8.3.3. Spearman's Rank Correlation

Unit IX INDEX NUMBERS (22 Periods)

- 9.1. Meaning
- 9.2. Types of Index Numbers
 - 9.2.1. Price Index
 - 9.2.2. Quantity Index
 - 9.2.3. Cost of Living Index
 - 9.2.4. Whole Sale Price Index
- 9.3. Uses and purpose
- 9.4. Methods of constructing Index Numbers
 - 9.4.1. Simple Index Number
 - 9.4.2. Weighted Index Number
 - Laspeyres' method
 - Paasche's method

Learning Outcomes of the Units

Unit I: ECONOMIC ENVIRONMENT FOR MANAGEMENT

The Learner;

- 1.1. identifies the meaning of economic environment
- 1.2. explains basic concepts in economic environment
- 1.3. states the importance of economic environment
- 1.4. explains various concepts
- 1.5. analyzes the various methods of measuring national income
- 1.6. identifies the problem in the calculations of national income
- 1.7. identifies the meaning of business cycle
- 1.8. assess the phases of business cycle

Unit II: WORKING CAPITAL MANAGEMENT

The Learner;

- 2.1. identifies the meaning of working capital
- 2.2. states the importance of working capital
- 2.3. explains the concepts of working capital
- 2.4. compares gross working capital with net working capital
- 2.5. explains different components of working capital
- 2.6. identifies different kinds of working capital
- 2.7. identifies the factor affecting working capital
- 2.8. states the meaning and importance of working capital
- 2.9. explains different approaches to working capital finance.

Unit III: LONG RUN INVESTMENT DECISION - CAPITAL BUDGETING

The Learner;

- 3.1 identifies the meaning of capital budgeting
- 3.2 states the importance of capital budgeting.
- 3.3 recognizes the process of capital budgeting.
- 3.4 classifies different types of capital budgeting methods.
- 3.5 explains the concept of payback period method.
- 3.6 explains the concept of average rate of return method.

- 3.7 applies various formulae for solving the problems.
- 3.8 compares between payback period method and accounting rate of return method.
- 3.9 explains the concept of net present value method.
- 3.10 explains the concept of IRR method.
- 3.11 explains the concept of profitability index method.
- 3.12 classifies different types of discounted cash flow techniques.
- 3.13 compares the difference between traditional methods and discounted cash flow techniques
- 3.14 solves problems by using different formulae.

Unit IV: **PRODUCTION AND OPERATIONS MANAGEMENT**

The Learner;

- 4.1. states the meaning and importance of production and operation management.
- 4.2. distinguishes between production and operation
- 4.3. identifies various types of decisions in production and operations management
- 4.4. distinguishes between various types of decisions in production and operations management
- 4.5. appreciates the importance of plant location
- 4.6. lists out various factors affecting plant location
- 4.7. observes and identify concept of plant payout
- 4.8. states the importance of plant layout
- 4.9. suggests suitable types of plant layouts
- 4.10. explains the concept aggregate planning, its meaning and importance
- 4.11. identifies the strategies used in aggregate planning
- 4.12. explains the concept, master production scheduling
- 4.13 develops a master production schedule (MPS)

Unit V: **QUALITY MANAGEMENT**

The Learner;

- 5.1 identifies the meaning of quality
- 5.2 recognizes the definitions of quality
- 5.3 explains the various approaches to quality
- 5.4 identifies various approaches to quality

- 5.5 explains the various approaches to quality
- 5.6 identifies various approaches to quality
- 5.7 states the meaning of quality management
- 5.8 explains the concept of quality management.
- 5.9 describes the various principles of quality management.
- 5.10 explains the meaning of quality management system
- 5.11 identifies the elements of quality management system
- 5.12 Abstracts the concept of ISO standards
- 5.13 Explains the concept of ISO 9000:2000.

Unit VI: **MEASURES OF CENTRAL TENDENCY**

The Learner;

- 6.1 identifies the concept of average
- 6.2 explains requisites of a good average
- 6.3 recognizes the concept of mean
- 6.4 develops skill to calculate mean for different series
- 6.5 identifies the meaning of weighted arithmetic mean
- 6.6 computes the weighted arithmetic mean
- 6.7 learns to compute combined mean
- 6.8 rectifies incorrect mean
- 6.9 recognizes the concepts of the term median
- 6.10 learns to compute the median in different situations
- 6.11 identifies the concepts of mode
- 6.12 computes the median in different situation
- 6.13 recognizes the concepts of locating median and mode graphically
- 6.14 lists out the partition values
- 6.15 learns to compute the quartiles, deciles and percentiles
- 6.16 compares mean, median and mode.
- 6.17 selects appropriate average to be used on different cases

Unit VII: **MEASURES OF DISPERSION**

The Learner;

- 7.1. identifies the meaning and significance of measures of dispersion.
- 7.2. lists out various methods of studying dispersion.

- 7.3. recognizes the use of absolute and relative measures of dispersion.
- 7.4. calculates range
- 7.5. interprets the result by using coefficient of range.
- 7.6. calculates quartile deviation
- 7.7. identifies the use of quartile deviation
- 7.8. interprets the result by using coefficient of quartile deviation
- 7.9. calculates mean deviation
- 7.10. interprets the result by using coefficient of mean deviation
- 7.11. identifies the limitations of range, quartile deviation and mean deviation.
- 7.12. identifies the concept standard deviation.
- 7.13. solves problems of standard deviation.
- 7.14. recognizes the use of standard deviation
- 7.15. interprets the result by using coefficient of standard deviation
- 7.16. lists out the qualities of a good measure of dispersion.

Unit VIII: **CORRELATION**

The Learner;

- 8.1. identifies the nature of relationship between variables.
- 8.2. recognizes the concept of correlation
- 8.3. distinguishes different types of correlation
- 8.4. recognizes the idea of drawing scatter diagram
- 8.5. identifies the type of correlation from a scatter diagram
- 8.6. classifies the types of correlation
- 8.7. recognizes the concepts of correlation coefficient
- 8.8. identifies properties of correlation coefficient
- 8.9. distinguishes direct and short cut methods
- 8.10. computes correlation coefficient under two methods
- 8.11. recognizes the concepts of rank correlation
- 8.12. identifies the circumstances in which rank correlation is preferred
- 8.13. distinguishes different situations for calculating rank correlation coefficient
- 8.14. computes rank correlation coefficient under three situations

Unit IX: **INDEX NUMBERS**

The Learner;

- 9.1. explains the meaning and characteristics of index number
- 9.2. classifies and describes various types of index numbers
- 9.3. describes the uses and purpose of index numbers
- 9.4. illustrates the various methods of construction of index numbers

Scheme of Work

Term	Unit Name	Month	Periods	Unit Weight in Scores
I	Economic Environment for Management	June	26	9
	Working Capital Management	July	22	9
	Long Run Investment Decision – Capital Budgeting	Aug.	24	9
II	Production and Operations Management	Sep,	22	9
	Quality Management	Oct.	16	7
	Measures of Central Tendency	Nov.	32	11
	Measures of Dispersion	Dec.	28	10
III	Correlation	Jan	18	8
	Index Numbers	Feb	22	8
Total			210	80

Unit 1

Economic Environment for Management

About the Unit

The success of a business not solely depends on its internal management, but also on many external forces. These external forces include consumers, other business firms, general economic conditions, government laws and regulations etc. Business has to monitor the changes happening in these external forces and adapt to these changes for its survival. Economic environment is main element of business environment. The economic environment is composed of various set of economic policies, economic system, strategy for economic growth and development, resource endowment, business cycle etc. This chapter deals with mainly national income and its basic concepts, methods for its measurement and problems in its calculations.

Unit Grid

Concepts/Ideas	Suggested Activity with Assessment	Learning Outcomes
Meaning and importance of economic environment	<p>General discussion/brain storming.</p> <p>General discussion on the meaning of economic environment.</p> <p>Recall various factors of economic environment.</p> <p>Brain storming on the importance of economic environment assessment.</p> <p>Assessment</p> <p>Participation in brainstorming and general discussion.</p> <p>Preparing notes.</p>	<p>The learner:</p> <ul style="list-style-type: none"> -identifies the meaning of economic environment. -explains basic concept in economic environment -states the importance of economic environment.
<p>National income.</p> <p>Basic concepts.</p> <p>Methods of national income measurement.</p> <ul style="list-style-type: none"> • Product method • Income method • Expenditure method 	<p>General discussion/Seminar/Case study</p> <p>General discussion on the concepts of national income.</p> <p>Seminar on methods for measuring national income.</p> <p>Case study- Problems in the calculation of national income</p> <p>Assessment</p> <p>Seminar presentation.</p> <p>Interpreting the case.</p>	<p>The learner:</p> <ul style="list-style-type: none"> -explains various concepts of national income -analyzes the various methods of measuring national income -identifies the problems in the calculations of national income.
Business cycle.	<p>General discussion</p> <p>General discussion on the basis of graph presented.</p> <p>Assessment</p> <p>Explaining the graph</p>	<p>The learner:</p> <ul style="list-style-type: none"> -identifies the meaning of business cycle -assesses the phases of business cycles.

Portfolio

Seminar report
News album pertaining to the economic indicators
Notes

Extended Activity

Collect monthly sales data during the last one year from 5 shops doing similar business in your town and analyze it on monthly wise. Link your findings with the different phases of business cycle.

Unit 2

Working Capital Management

About the Unit

Every organization requires broadly two kinds of capital. One for investing in fixed assets and another for financing routine activities. Investment in fixed assets is called fixed capital and investment in current asset is called working capital. This chapter mainly deals with working capital and its management. The idea behind working capital management is to manage current asset and current liability of a firm in such a way that a satisfactory level of working capital is maintained.

Unit Grid

Concepts/Ideas	Suggested Activity with Assessment	Learning Outcomes
Meaning and importance of working capital.	Case study/brainstorming/Discussion Discussion on meaning of working capital. Brainstorming on the importance of working capital. Assessment Participation in discussion. Identification classification	The Learner; - identifies the meaning of working capital. -states the importance of working capital.
Concepts of working capital.	General discussion/Problem solving A model balance sheet is presented and examines the current assets and liabilities Discussion is carried out on that basis. Simple problems are given to find out gross and net working capital. Assessment Identify the concept of working capital	The Learner; - explains the concepts of working capital. - compares between gross working capital and net working capital.
Components of working capital.	Brain storming and discussion. Responses regarding day to day business of a manufacturing concern are elicited. Assessment Cites examples of the components of working capital	The Learner; -identifies different components of working capital.
Kinds of working capital.	General discussion. Annual report/balance sheet of a company may be used a supplementary source of information. Assessment Preparation of chart Classifying the working capital	The Learner; -identifies different kinds of working capital. -compares different kinds of working capital.

Factors determining the working capital requirement.	Case study initiating discussion through questions related to the size, nature operating cycle etc. of the requirement. Assessment Participation.	The Learner; -identifies the factors affecting working capital.
Working capital management.	General discussion/case study. Discussion initiated by asking questions related to importance of money in day to day activities. Discussion in the requirement of money in business, services availability and its utilization. Assessment Cites incidents of low working capital	The Learner; -states the meaning and importance of working capital.
Approaches to working capital finance.	Proves stating on how a company will raise the sufficient amount of working capital by taking into account the risk profitability and cost.	The Learner; -explains different approaches of working capital finance

Portfolio

- Prepared notes
- Chart showing various sources working capital
- Prepared Power Point Presentation

Extended Activities

1. News relating to Cashew Factory Industry is collected and analyse the problems faced by them in terms of shortage of supply of raw materials.
2. Visit a small enterprise working in and around your location. Ask the entrepreneur how he arranged his working capital? Also ask the entrepreneur the problem he faced in arranging working capital?
3. Prepare a list of formal agencies in Kerala that provide working capital finance to small traders.

Unit 3

Long Run Investment Decision – Capital Budgeting

About the Unit

The allocation of funds of a concern mainly depends on its investment decision. It is a choice of assets such as short term or current assets and long term or fixed assets where funds will be invested. The investment decision which relates to the short term or current assets is known as working capital management or current assets investment decision whereas the investment decision relating to the long term or fixed assets is known as capital budgeting or capital expenditure decision or long term investment decision.

Unit Grid

Concepts/Ideas	Suggested Activity with Assessment	Learning Outcomes
Meaning and Importance of Capital Budgeting Capital Budgeting Process	General discussion/Brainstorming General discussion on the Meaning of capital budgeting. Brainstorming on the importance of capital budgeting. Listing out the different processes of capital budgeting. Assessment Participation in Brainstorming and general discussion. Convergence of points and preparing notes.	The learner : -identifies the meaning of capital budgeting - states the importance of capital budgeting. - recognizes the process of capital budgeting.
Methods of Capital Budgeting -Traditional Pay Back Period Method -Average Rate of Return Method	General discussion/Group Discussion/Case analysis General discussion on the concepts of payback period and ARR method. Group discussion on the classification of capital budgeting methods. Case analysis for solving problems of payback period method and ARR method. Assessment Participation in the general and group discussion. Solve problems of payback period method and ARR method by applying various formulas. Prepare notes and listing various methods of capital budgeting decisions	The learner : - classifies different types of Capital Budgeting Methods. - explains the concept of Payback period method. - explains the concept of Average Rate of Return Method. - applies various formulae for solving the problems. - compares between payback period method and accounting rate of return method.

<p>Methods of Capital Budgeting – Discounted Cash Flow Techniques (Time Adjusted Method). Net Present Value Method. Internal Rate of Return Method. Profitability Index Method.</p>	<p>General discussion/Brainstorming/Case Analysis General discussion on the concepts of NPV Method, IRR Method and Profitability Index Methods. Brainstorming on the differences between NPV, IRR and Profitability Methods. Case Analysis for solving problems of NPV, IRR and Profitability Methods. Assessment Participation in the general discussion. Solving problems of NPV, IRR and Profitability Methods. Preparing notes and listing various discounted cash flow methods of capital budgeting decisions.</p>	<p>The learner : -explains the concept of Net Present Value Method. -explains the concept of IRR Method. -explains the concept of Profitability Index Method. -classifies different types of Discounted Cash flow techniques. -compares the difference between Traditional Methods and Discounted Cash flow techniques -solves problems by using different formulae.</p>
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Portfolio

Prepared notes

Prepared a table of comparison between traditional and modern methods

Solved problems on project evaluation

Extended activity

Visit one or more small scale industrial units and examine their project reports and prepare an account of capital budgeting techniques used for the evaluation projects.

Unit 4

Production and Operations Management

About the Unit

The reason for the existence of any organization is to fulfill the needs of the customer. These needs may be fulfilled through tangible products or intangible services. The management of manufacturing of products is referred to as Production Management and the functions dealing with the operation of services are covered under Operations Management. This unit throws light on the meaning and importance of Production and Operation Management and some important management concepts coming under the function of production and operation.

Unit Grid

Concepts/Ideas	Process/Activity with Assessment	Learning Outcomes
Meaning of Production and Operation Management.	<p>General Discussion</p> <p>Discussion is carried out on the various activities carried out in a factory recalling the functions of management.</p> <p>Assessment:</p> <p>Define the term Production and Operation Management.</p>	<p>Learner;</p> <p>-defines the term production</p> <p>-recognizes the meaning of production management.</p>
Importance of Production Management	<p>General Discussion</p> <p>Students are directed to go through some questions discussed in the class leading them to the importance of production management.</p> <p>Assessment:</p> <p>Identification of correct statement.</p>	<p>Learner;</p> <p>-identifies the importance of production management.</p>
Difference between Production and Operation	<p>Group Discussion</p> <p>Students are grouped and give some instances of production and operation and they are to differentiate between them in groups.</p> <p>Assessment:</p> <p>Problem Solving – filling the missing points</p> <p>Identify the instances of production and operation.</p>	<p>Learner;</p> <p>- distinguishes between production and operation.</p>
Major Decisions of Production Management	<p>Brain Storming/Workshop</p> <p>Students are asked to list out the various decisions to be taken in a factory. The meaning of various types of decisions are informed to them and they are given a list of decisions and</p>	<p>Learner;</p> <p>-identifies strategic decisions.</p> <p>-identifies tactical decisions.</p> <p>-identifies</p>

	<p>classify them into strategic, tactical and operations and prepare a chart.</p> <p>Assessment: Classification of decisions. Preparation of chart</p>	<p>operational decisions. -distinguishes between strategic, tactical and operational decisions. -cites examples for strategic, tactical and operational decisions.</p>
<p>Plant Location and factors affecting plant location</p>	<p>Case Study The case of an entrepreneur planning to start an industry is given to students. The various factors affecting his decisions are included in the case.</p> <p>Assessment: Correct understanding of the case Suggesting Suitable solution.</p>	<p>Learner; - identifies the importance of plant location. - recognizes the various factors affecting plant location.</p>
<p>Plant Layout and different types of Plant Layouts</p>	<p>Field Study A nearby industrial unit is visited and study the physical arrangement of the machines, buildings and equipments.</p> <p>Assessment: Identification of the need of plant layout. Citing examples for different types of plant layout. Chart preparation Listing out the benefits of plant layout.</p>	<p>Learner; -identifies the importance of plant layout. -recognizes the different types of plant layout. -suggests suitable type of layout. - recognizes the benefits of plant layout.</p>
<p>Aggregate Planning – Meaning, Importance and Strategies</p>	<p>General Discussion Some examples of aggregate planning is given and students are lead to the meaning importance and the types</p> <p>Assessment: Identification of the type of strategies. Chart preparation</p>	<p>Learner; -identifies the meaning of aggregate planning. -recognizes the importance of aggregate planning. - differentiates between various types of aggregate planning.</p>
<p>Master Production Scheduling - meaning, significance and development of Master Production Schedule (MPS)</p>	<p>Case Study/Problem Solving A case which necessitates the need of Master Production Scheduling is given to students. They are also given a problem for the preparation of Master Production Schedule.</p> <p>Assessment: Identification of the type of strategies.</p>	<p>Learner; -identifies the meaning of master production scheduling. -Identifies the significance of master production</p>

	Preparation of Master Production Schedule.	scheduling. -identifies the process of master production scheduling. -develops the skill of preparing master production schedule
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Portfolio

Chart showing the major decisions in Production and Operations Management

Chart showing the Types of Layout

Sketches showing sample layouts

Field visit report

Diagram of Master Production Scheduling Process

Sample Master Production Schedule

Extended Activities

Meet some entrepreneurs working in and around your locality. Find out the various factors he/she considered while selecting location for his/ her enterprise. Analyze the same and suggest if he/she could have other better options available for selecting the location of the enterprise.

Unit V

Quality Management

About the Unit

In business, engineering and manufacturing, quality has a pragmatic interpretation as the *non-inferiority* or *superiority* of something; it is also defined as *fitness for purpose*. Quality is a perceptual, conditional, and somewhat subjective attribute and may be understood differently by different people. Consumers may focus on the specification quality of a product/service, or how it compares to competitors in the marketplace. Producers might measure the conformance to quality, or degree to which the product/service was produced correctly. Quality management ensures quality in all areas of marketing, design, purchasing, production or operations and distribution. The entire organisation should excel on all dimensions of products and services that are important to the customer and strive to achieve Total Quality Management (TQM).

Unit Grid

Concepts/Ideas	Suggested Activity with Assessment	Learning Outcomes
Meaning and Definition of Quality	General discussion/Brainstorming Brainstorming on the meaning of quality General discussion on the definitions of quality Assessment Participation in Brainstorming and general discussion. Convergence of points and preparing notes.	The learner : -identifies the meaning of quality -recognises the definitions of quality
Approaches to Quality <ul style="list-style-type: none"> • Transcendent • Product based • User based • Manufacturing based • Value based 	General Discussion General discussion on the various approaches to quality Assessment Listing out the approaches.	The learner; -explains the various approaches to quality -identifies various approaches to quality

<p>Dimensions of Quality Product and Service</p>	<p>Group Discussion Group discussion on the dimensions of quality. Assessment Participation in the group discussion. Teacher assessment Preparing notes and listing various methods of capital budgeting decisions</p>	<p>The learner : -recognises the dimensions of quality. -explains the concept of product quality. -explains the concept of service quality. -compares between product quality and service quality</p>
<p>Meaning and Concept of Quality Management</p>	<p>General discussion/Brainstorming General discussion on the meaning and concept of Quality Management Assessment Participation in the general discussion. Conceptual clarity attained Assimilation of ideas</p>	<p>The learner : -states the meaning of Quality Management -explains the concept of Quality Management.</p>
<p>Principles of Quality Management</p>	<p>General discussion/Group discussion General discussion on the various principles of Quality Management Group discussion on the key benefits of each principle of Quality Management Assessment Participation in the general discussion. Peer assessment. Notes on the principles of management.</p>	<p>The learner: -describes the various principles of quality management.</p>
<p>Quality Systems Elements of Quality Management System</p>	<p>Case study/General discussion General discussion on the meaning of Quality Systems Case study for showing various elements of Quality Management Systems. Assessment Attainment of concept Involvement in discussion</p>	<p>The learner: -explains the meaning of Quality Management System -identifies the elements of Quality management System.</p>

<p>ISO Certification ISO 9000:2000</p>	<p>Case Analysis/General discussion Case Study for ISO standards General discussion on the ISO 9000:2000 Assessment Teacher assessment Ability to analyse Ability to reason</p>	<p>The learner : -abstracts the concept of ISO standards -explains the concept of ISO 9000:2000.</p>
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Portfolio

Notes
News album
Charts

Extended activities

1. Visit the web sites of different companies and prepare a list of companies and the quality certification they have attained.
2. Conduct a survey among people of your locality about the awareness of different quality standards.

Unit VI

Measures of Central Tendency

About the Unit

Condensation of data is necessary in statistical analysis. This is because a large number of big figures are not only confusing but also difficult to analyze. Therefore, in order to reduce the complexity of data and to make them comparable it is necessary that various data are reduced to a single value. This can be done by using central tendency or Averages which summaries the whole data in single value in such way that this single value can represent the entire data. The word average is commonly used in day-to-day life eg. Average production, average expenditure, average income, average marks obtained by students in a class etc. The concept of measure of central tendency is an important tool in the statistics. The measure of central tendency is also called Averages or Measure of location. This unit gives an idea to the students on the concept of Averages, qualities of good average, types of averages etc. This unit also help the learners learn to calculate different types of averages from a data.

Unit Grid

Concepts/Ideas	Suggested Activity with Assessment	Learning Outcomes
Measures of central tendency: Concepts Properties Types of Averages	Case analysis, group discussion and brain storming by giving a data showing marks obtained by students in a class Group discussion on the need for the summarization data. General discussion on the concept of Average Brainstorming on the requisites of a good average Assessment Participation in discussion Understanding the concept Notes prepared on requisites of a good average List on types of averages	The learner; -recognizes the need for summarizing data -identifies the concept of Average -explains requisites of a good average -elicits types of averages -distinguishes different types of averages
Arithmetic Mean Meaning and types of Mean Computation of Simple Average for Individual, discrete and continuous series	Discussion and problem solving Initiate discussion by giving different data showing daily income of family in a village, marks obtained by students in a class etc General discussion on meaning and types of Mean Assessment Participation in discussion Arrangement of data Finding out mean	The leaner; -recognizes the concept of mean -classifies the data in different series -develops skill to calculate Mean for different series

	Preparation of report on mean of different data	
Weighted arithmetic Mean: meaning and computation	<p>General discussion and problem solving</p> <p>General discussion is initiated by exhibiting a table showing index numbers of various group of items and its weights</p> <p>The concepts of simple averages are compared with weighted average</p> <p>Finding out weighted averages by giving concerned formula</p> <p>Assessment</p> <p>Participation in discussion</p> <p>Distinguishes simple average and weighted average</p> <p>Solving the problem</p>	<p>The learner;</p> <ul style="list-style-type: none"> -identifies the meaning of weighted arithmetic mean -computes the weighted arithmetic mean -compares weighted average with simple average
Combined Mean: Computation	<p>General discussion and problem solving</p> <p>Ask the students , what is the combined mean by giving mean age of two groups of students</p> <p>Initiates discussion on the problem by giving concerned formula</p> <p>Assessment</p> <p>Participation in discussion</p> <p>Solving the problem</p>	<p>The learner ;</p> <ul style="list-style-type: none"> -recognizes the concepts of combined mean. -learns to compute combined Mean
Correction in Mean:	<p>Case analysis and problem solving</p> <p>A case of incorrect Average of marks secured by students in a class is given to the students and discuss the reason for incorrect mean</p> <p>By recalling the formula for calculating the Mean, the correct mean is calculated.</p>	<p>The learner;</p> <ul style="list-style-type: none"> -identifies reasons for incorrect mean -rectifies incorrect mean
Median : Meaning and computation – Individual, discrete and continuous series	<p>General discussion ,Class room activity and work out the problem</p> <p>A general discussion is initiated to make familiar of the term median by giving following activity</p> <p>Select 15 students having different weights from the class</p> <p>Instruct them to stand in ascending order of their weights</p> <p>Tell a students to choose middle most student in the line and to measure the weight of the student</p>	<p>The learner;</p> <ul style="list-style-type: none"> -recognizes the concepts of the term median -analyses the different types of formula used in different series -learns to compute the median in different situations

	<p>Through above activity teacher helps the students to recognize the concept of term Median. Teacher also helps the students to calculate median in different series by giving different types of problems</p> <p>Assessment Participation in Class room activity Work out Problems Prepared notes</p>	
<p>Mode : Meaning and computation- Individual, discrete and continuous series</p>	<p>General discussion and class room activity Teacher initiates discussion through the following activity; Teacher collects the measure of weights of students in the class. Tell the students to prepare a table showing measure of heights of students in different series. Ask students to find out measure of weight which occurs maximum number of times in the table. Through above discussion, teacher helps the students to attain the concepts of Mode. Teacher also helps the students to compute median under different situations by giving different series of observations.</p> <p>Assessment Participation in activity Preparation of table Find out the median Work out the problem</p>	<p>The learner; -identifies the concepts of mode -recalls the different types of observations -analyses the formula used in different situations -computes the median in different situation</p>
<p>Determination of Median and Mode graphically</p>	<p>Group activity Teacher divides students into groups and instruct each group to draw Ogive and Histogram in graph paper by giving suitable data. Group discussion is initiated on prepared graphs . Through discussion, teacher helps the students to locate median with the help of Ogive and mode with the help of Histogram.</p> <p>Assessment Participation in discussion Draw chart in graph paper Locate the median and mode graphically</p>	<p>The learner; -recognizes the concepts of locating median and mode graphically -draws chart examines the graphs</p>

<p>Partition Values: Quartiles, Deciles and Percentiles- Meaning and computation</p>	<p>General Discussion and problem solving Teacher initiates general discussion on the meaning of Median. Through this discussion teacher helps the students to recognize the concept of Quartile, Deciles and Percentiles. Teacher also initiates the discussion to solve various problems giving to students with the help of concerned formulae</p> <p>Assessment Recalling the meaning of Median Participation Solving the problem</p>	<p>The learner; -lists out the partition values -recognizes the meaning of partition values -learns to compute the quartile , deciles and percentile</p>
<p>Relationship between Mean, Median and Mode</p>	<p>General Discussion Teacher recalls the use, merits and demerits of types of averages and initiates a general discussion on it. Through this discussion teacher helps the students to recognize resemblances and differences among the various averages. Teacher also helps the students to identify the appropriate average to be used on different cases depending upon the purpose of analysis and nature of distribution and to prepare a comparative statement of averages on the basis of above discussion</p>	<p>The learner; -compares Mean, Median and Mode. -selects appropriate average to be used on different cases -prepares the statement showing the comparison of averages</p>

Portfolio

- Notes
- Ready reckoner of formulas of central tendency
- Table of comparison of different types of averages
- Solved problems

Extended Activities

Collect the data with help of a schedule from 10 families in your locality and find average income, expenditure and savings of each family

Unit VII

Measures of Dispersion

About the Unit

Averages are the representatives of a given data. However the individual values in the series may vary too much from the average. In such case we cannot say that the average calculated is truly representing the whole series. It necessitates the study of variations from the average to know the reliability of the average. The averages of two series may be same but reliability may be different. This chapter enables students to measure the variation of values from average, compare the averages of two or more series of data and identify the most consistent series.

Unit Grid

Concepts/Ideas	Suggested Activity with Assessment	Learning Outcomes
7.1. Meaning and Significance of Measures of Dispersion.	<p>Problem Solving/General Discussion An example of three different data along with its averages is given and students are asked to observe the data and find the variations. Through general discussion they are directed to get the significance.</p> <p>Assessment Problem solving</p>	<p>The learner; -recognizes the meaning of measures of dispersion. -identifies the significance of the measure of dispersion.</p>
7.2. Properties of a good measure of Dispersion.	<p>Group Discussion Students are given the properties in as hand outs and are grouped and discussed.</p> <p>Assessment Listing out the properties.</p>	<p>The learner; -identifies the properties of a good measure of dispersion.</p>
7.3. Methods of studying Dispersion.	<p>General Discussion Through general discussion students are made to identify the methods of dispersion</p> <p>Assessment Naming the methods</p>	<p>The learner; -identifies various methods of the calculation of dispersion</p>
7.4. Absolute and Relative Measures of Dispersion.	<p>Group Discussion Students are asked to study a problem given to them and suggest solutions.</p> <p>Assessment Identification of the importance</p>	<p>The learner; -identifies the absolute and relative measures. -recognizes the importance of absolute and relative measures.</p>
7.5. Range - Individual Observation, Discrete Series, Continuous Series.	<p>Observation/Problem Solving Students are given some data for observation and identify the lowest and highest value the variation. Further Problems are given for solution</p> <p>Assessment</p>	<p>The learner; -identifies the concept range. -solves the problems on range. -identifies the uses of</p>

	<p>Observation ability. Problem solving</p>	range.
7.6. Coefficient of Range.	<p>Problem Solving Two sets of data each given for comparison. The problem of comparison is solved by co-efficient. Assessment Problem solving Interpreting the result.</p>	<p>The learner; -identifies the concept -solves problems -interprets result.</p>
7.7. Quartile Deviation - Individual Observation, Discrete Series, Continuous Series.	<p>Group Discussion /Problem Solving An individual series with two extreme values are given and the drawback of range in such situation discussed. As a solution, the concept of quartile deviation is arrived at. Further Problems are given for solution Assessment Raising the limitations. Problem solving</p>	<p>The learner; -recognizes the limitation of range. -identifies the concept quartile deviation. -solves problems</p>
7.8. Co efficient of Quartile Deviation	<p>Problem Solving Problems are given for solution and interpretation. Assessment Problem solving Interpreting the result.</p>	<p>The learner; -identifies the concept -solves problems -interprets the result.</p>
7.9. Mean Deviation - Individual Observation, Discrete Series, Continuous Series.	<p>Problem Solving Problems are given for solution Assessment Problem solving</p>	<p>The learner; -identifies the concept -solves problems</p>
7.10. Co efficient of Mean Deviation	<p>Problem Solving Problems are given for solution Assessment Problem solving Interpreting.</p>	<p>The learner; -identifies the concept -solves problems -interprets the result.</p>
7.11. Standard Deviation - Individual Observation, Discrete Series, Continuous Series.	<p>Group Discussion /Problem Solving Drawbacks of the various measures of dispersion are discussed. The possibility of avoiding the negative and positive signs while calculating mean deviation may be discussed. The benefit of squaring the deviation is taken into consideration. The formula of standard deviation is developed through discussion. Problems are given for solution Assessment Listing out the demerits of various measures. Define the standard deviation.</p>	<p>The learner; -identifies the limitations of various measures. -recognizes the need of a reliable measure. -identify the concept SD. -solves problems -interprets result.</p>

	Problem solving	
7.12. Co efficient of Standard Deviation/Variance	Problem Solving Problems are given for solution Assessment Problem solving	The learner; -identifies the concept -solves problems -compares data -interprets the result. -finds areas of application.

Portfolio

Charts showing the equations of range, quartile deviation, mean deviation, standard deviation and their co efficient.

Solved problems of range and its coefficient.

Solved problems of quartile deviation and co efficient of quartile deviations.

Solved problems of mean deviation and its co efficient.

Solved problems of standard deviation and its co efficient.

Extended Activities

Collect marks obtained by all students in your class in first year VHSE examination and analyze the data with the help of dispersion measures and comment on its findings.

Unit VIII

CORRELATION

About the Unit

Measures of Central tendency and Dispersion already discussed are dealt with a single variable. In many cases, there exists some sort of relationship among variables and is required to measure the degree and extend of such relationship numerically. In statistics, correlation is the tool used to measure the relationship among the variables. Correlation analysis helps a lot in several decision making areas of management. For example, price of a product and its competitive products, amount spend on advertisement and sales generated, training program given to workers and their efficiency, etc.

This unit gives an idea to the students about the concepts of correlation, types of correlation and techniques of measuring correlation.

Unit Grid

Concepts/Ideas	Suggested Activity with Assessment	Learning Outcomes
Correlation: Concepts Types of Correlation	Case analysis, general discussion and brain storming Initiate discussion by giving various examples of price and demand of product ,rainfall and agricultural production, income and expenditure of a family etc Brainstorming on the relationship between these two variables General discussion on the concept correlation Elicits types of correlation Assessment Participation in discussion Understanding the concept of correlation List on types of correlation.	The learner; -identifies the nature of relationship between variables. -recognizes the concept of correlation -distinguishes different types of Correlation
Methods of Measuring correlation: Diagrammatic Method	Group activity and problem solving Teacher divides students into groups and instruct to plots variables as points on a graph paper by giving suitable data Recall the graphical representation of data General discussion on plotting the	The learner; -recognizes the idea of drawing scatter diagram -identifies the type of correlation from a scatter diagram -classifies the types of

	<p>variables and draw straight lines on graph paper. Finding out the types of correlation</p> <p>Assessment</p> <p>Participation in discussion Drawings of graph paper Preparation of report on types of correlation</p>	correlation
<p>Karl Pearson's Correlation coefficient: Concepts and its computation- Direct method and short cut method</p>	<p>General Discussion and problem solving Teacher initiates discussion by giving cases of two variables of X and Y Recall the linear relationship of two variables Discuss the properties of correlation coefficient Teacher helps to compute correlation under direct and short cut methods by giving concerned formula. Teacher also helps the students to understand differences between two methods</p> <p>Assessment</p> <p>Participation in discussion Recall the types of correlation Work out problems</p>	<p>The learner;</p> <ul style="list-style-type: none"> -recognizes the concepts of correlation coefficient -identifies properties of correlation coefficient -distinguishes direct and short cut methods -computes correlation coefficient under two methods
<p>Spearman's Rank correlation: Concepts, properties and computations under three situations</p>	<p>Case analysis and problem solving Teacher provides 3 cases one by one to students and explains the circumstances in which rank correlation coefficient is preferred to simple correlation coefficient. Teacher also initiates discussion on above cases and helps the students to compute rank correlation coefficient under three different situation by giving suitable formula.</p> <p>Assessment</p> <p>Participation in discussion Observation in case analysis Work out problems</p>	<p>The learner;</p> <ul style="list-style-type: none"> -recognizes the concepts of Rank correlation -identifies the - circumstances in which rank correlation is preferred -distinguishes different situations for calculating rank correlation coefficient -computes rank correlation coefficient under three situations

Portfolio

Prepared notes

Prepared a scatter diagram of the marks obtained by girls and boys in the last examination

Extended activities

1. Collect the market price of a share of SBT during the last 10 days and compare the same with SENSEX average of those days using correlation and interpret the result.
2. Select 10 families of your locality and collect their income and expenditure during last month and make a correlation analysis.

Unit IX

Index Number

About the Unit

When you read Daily News Papers or watch T V News, you might have noticed that the SENSEX Index was dropped down by 200 points or shoot up by 300 points and so. What it indicates? It is the ratio of the average change in the today's market price of group of securities/shares in relation to their prices at particular previous date. The study of this chapter enables to understand the concept of 'Index Number, it's types, significance, uses, methods of construction.....,etc.

Unit Grid

Concepts/Ideas	Suggested Activity with Assessment	Learning Outcomes
Index Number -Meaning -Features	General Discussion Discussion is carried out by eliciting the examples of SENSEX data from News paper Assessment Participation in Discussion List prepared on features	The Learner: -explains the meaning and characteristics of index number
Types of Index Number -Price Index -Quantity Index -Cost of Living Index -Whole sale price Index	General Discussion Discussion is carried out by eliciting the examples of various index numbers helping them to identify and classify each types of index numbers Assessment Participation in discussion List prepared on types of index number after identification	The Learner; -classifies and describes various types of index numbers
Index Number -uses -purposes	Group discussion Discussion is initiated by providing examples of uses and purposes of index numbers Assessment Participation in the discussion List prepared about the uses and purpose of Index Number	The Learner; -describes the uses and purpose of index numbers
Methods of construction of index number -simple method -Laspeyer's method -Paasche's method	Problem solving Table showing prices and quantities of various commodities in different calendar years are given to compute index number under different method Assessment Solving problems	The Learner; -illustrates the various methods of construction of index numbers

Portfolio

Prepared notes

Solved problems
Prepared index numbers with sample data

Extended activities

1. Collect price of selected food items in one year back and in the current year. Prepare index number by giving quantity consumed during current year as weight.
2. Find out the method adopted by Government of India for the compilation of cost of living index in India

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