

# LEARNING OUTCOMES AND EXAM CONTENT MANUAL

**CPIA  
CERTIFIED**  
PRODUCTION AND  
INVENTORY ANALYST

# About program

Operating within a manufacturing and operations environment and having control over the wide range of manufacturing activities that take place within a typical manufacturing or process industry is a competitive advantage in today's dynamic economy. Gaining this competitive advantage requires being able to identify the various operations within manufacturing and operations, and in turn recognizing the need to initiate and implement a number of continuous improvement initiatives to reduce operating costs and increase throughput.

This program is designed to increase your knowledge of a business environment and in particular the role manufacturing plays in business. The program will provide insights into the many opportunities that exist within manufacturing for well-qualified personnel.

The program covers the role of manufacturing and operations in the 21st century, how manufacturing forms the "engine" of the supply chain, the role of planning and scheduling in manufacturing, the various manufacturing strategies and engineering materials, and the materials management and industrial engineering support functions. Each presents a challenge to those who are engaged in the field of manufacturing and operations.

## Program objective

The aim of Certified Production and Inventory Analyst training is to provide the foundation skills and knowledge in the field of manufacturing and operations management.

**Certified Production and Inventory Analyst is designed to help you develop an understanding of:**

- Introduction to manufacturing and operations management
- Planning and scheduling
- Materials management
- Manufacturing and manufacturing processes
- Manufacturing and operations support functions

## Perfect program for:

- **Supply chain operations, production planning, procurement executives, supervisors, managers, and department heads, particularly those at the supervisory level tasked with managing inventories, quality control, product development, R&D, and business planning management activities.**
- Manufacturing personnel, particularly those at an operational level tasked with participating in a manufacturing environment.
- **Individuals wishing to enhance their knowledge of manufacturing, production, planning, methodology of supply chain operations. Employees who may interact with higher-level supply chain leaders and wish to feel on equal footing regarding knowledge.**
- Manufacturing supervision, those entrusted with the operation of a company's manufacturing facilities.
- **Individuals wishing to enhance their knowledge of manufacturing and operations in the 21st Century.**
- Career starters wishing to make manufacturing, production and inventory management a career within the supply chain. Bachelor's and master's level students who wish to supplement an advanced degree with an equally advanced supply chain certification to gain a competitive advantage in the job market.



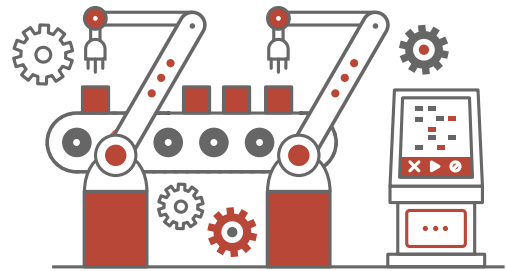
# Learning outcomes and exam content

## Module 1

### Introduction to manufacturing and operations management

#### Course outline

- 1.1 Business formation and business strategy
- 1.2 Business functions and activities
- 1.3 Management
- 1.4 Supply chains and customer service



#### Learning outcomes

- Name the objectives a business would establish for its operations;
- Distinguish between unincorporated businesses and incorporated businesses; give examples of each;
- Name the four primary functions of management; provide a brief explanation of each function;
- Define supply chain and supply chain management; with the aid of a diagram, show how demand, supply and information flows through the supply chain;
- Distinguish between the roles of strategic, tactical, and operations planning in supply chain management;
- Name the four leadership styles and give examples of where each leadership style would be the most appropriate;
- Define customer service; explain the importance of customers to a business;
- Outline the steps to be taken to ensure a successful communication process both within an organization and with the outside world.

#### Exam content

This module outlines Business Formation and Strategy and introduces the various forms of business formation, distinguishing between incorporated businesses and unincorporated businesses, while examining the advantages and disadvantages of each.

The module reviews the purpose of a business strategy and examines the role of the vision and mission statement in formulating a business strategy. The various organization structures are explained, and a number of business functions and activities are outlined.

The module examines management, supply chain, and customer service and introduces the role of management, the structure of the supply chain, and measures of customer service. The role of management is examined and the four management functions are outlined while distinguishing between line, function, and staff relationships.

The structure of the supply chain is outlined and a description of what a supply chain is and how a supply chain is used to improve company performance is examined. The importance of customers and customer service is emphasized and a distinction is made between internal customers and external customers.

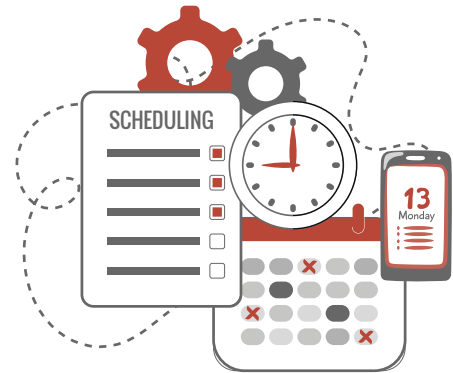
# Learning outcomes and exam content

## Module 2

### Operations planning and scheduling

#### Course outline

- 2.1 Forecasting and demand management
- 2.2 Planning and scheduling
- 2.3 Materials planning
- 2.4 Capacity planning



#### Learning outcomes

- Distinguish between qualitative forecasting techniques and quantitative forecasting techniques;
- Explain the importance of tracking forecast error and making adjustments to a forecast when demand exceeds forecast by a large degree;
- Compare long-range, medium-range, and short-range planning; give examples from each category;
- Distinguish between planning and scheduling; with the aid of examples describe a number of planning and scheduling tools;
- Give a description of the master scheduling process; explain the role of rough-cut capacity planning in master scheduling;
- Give the purpose of materials planning and capacity planning in a manufacturing environment;
- With the aid of a flow diagram, give an explanation of the materials planning process;
- Give an explanation of how capacity planning is used to balance load with capacity at one or more work centres.

#### Exam content

This module examines Planning, forecasting, and scheduling and explains the roles of planning, forecasting and scheduling in a manufacturing environment.

The module distinguishes between long-range, medium-range, and short-range planning; examining the component parts of each.

The role of forecasting and demand management in a manufacturing environment is outlined and a number of different forecasting techniques are reviewed. A distinction is made between planning and scheduling and a number of scheduling tools are examined.

Master scheduling and the role of master scheduling in a manufacturing environment is explained, along with a description of how rough-cut capacity planning is used in master scheduling.

Material and capacity planning is explained in manufacturing and the greater supply chain. The material requirements planning process is described and a range of different bills of material formats is examined.

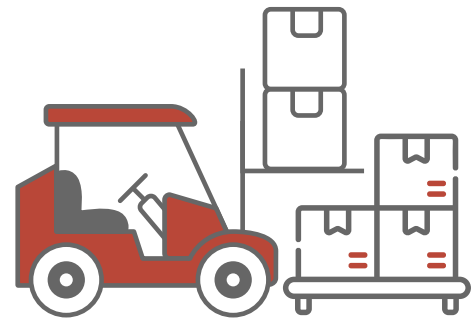
The capacity planning process is examined with an explanation of how capacity and load are balanced at each stage in the priority and control hierarchy. Different productivity and capacity measures are examined.

# ” Learning outcomes and exam content

## Module 3 Materials management

### Course outline

- 3.1 Purchasing, and warehousing
- 3.2 Inventory management and materials handling
- 3.3 Transportation and distribution



### Learning outcomes

- Define materials planning; give the role of materials planning in the supply chain;
- Describe the purchasing cycle; outline the requirements when selecting a supplier;
- Give the role of warehousing in the supply chain; describe a number of warehouse activities;
- Explain what inventory is, and why it is necessary to hold inventory at various points along the supply chain;
- Distinguish between the various types, functions and costs of inventory; give examples from each, outline the importance of managing each;
- Name and give an explanation of each category of materials handling equipment;
- Discuss the role of transport and transportation in the distribution of goods to customers;
- Explain the process of physical distribution; distinguish between carriers and the modes of transportation;

### Exam content

This module examines materials management and outlines the role of materials management in manufacturing and the greater supply chain. Purchasing is discussed with the role of purchasing and the purchasing process is explained.

Warehousing in the supply chain and the importance of effective warehouse practices is examined. Different categories of warehouse are reviewed along with the advantages and disadvantages associated with each.

The process of inventory and inventory management is examined and a distinction is made between the types and functions of inventory. The importance of managing inventory and inventory costs is explained. Methods of managing inventory are outlined.

Materials handling and materials handling equipment is examined and the role of materials handling and storage equipment in the warehouse and distribution is explained.

Transportation is examined with an explanation of freight management and the different modes of transport in moving goods through the supply chain is explained.

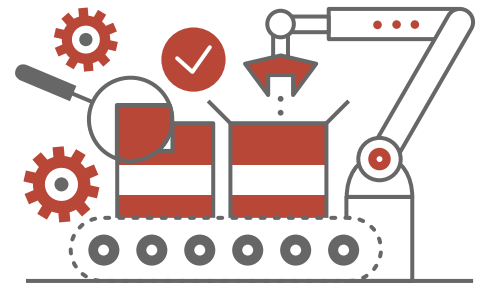
Physical distribution in the supply chain is examined, and an introduction to protective packing is given.

# Learning outcomes and exam content

## Module 4 Manufacturing and manufacturing processes

### Course outline

- 4.1 Manufacturing and technology
- 4.2 Manufacturing strategies
- 4.3 Types of production
- 4.4 Manufacturing processing, and manufacturing materials



### Learning outcomes

- Name the major groups of knowledge in business; give a brief explanation of each;
- Name and give a brief explanation of each of the components of a representative technological transformation system;
- With the aid of a diagram, give an explanation of the volume-variety matrix;
- Explain the importance of teaming up with suppliers and customers at each level in the supply chain;
- Distinguish between primary sector industries, secondary sector industries and tertiary sector; give examples from each sector;
- Name the different types of production systems; give examples of the products produced by each;
- Name the manufacturing processing families; indicate the significant differences between them;
- Distinguish between engineering materials and non-engineering materials; give examples from each category.

### Exam content

This module examines manufacturing and manufacturing strategies and introduces the field of manufacturing, giving an explanation of each manufacturing strategy.

The module outlines the major groups of knowledge, and the role technology plays in manufacturing. The elements of technological systems are explained and a distinction is made between the various types of technological systems.

The module outlines the manufacturing strategies and differentiates between the product positioning strategies and process strategies. The steps for teaming up with customers are examined and a number of management support functions is outlined.

The types of production and production materials is examined and the different types of production along with a range of manufacturing materials is discussed.

Manufacturing inputs, processes and outputs for different types of production are explained and a distinction between primary, secondary and tertiary industries is outlined.

The module outlines a range of manufacturing processes and distinguishes between the different materials used in manufacturing.

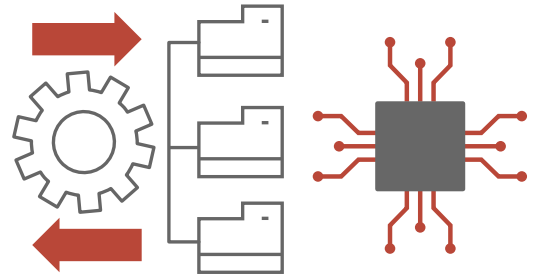
# Learning outcomes and exam content

## Module 5

### Manufacturing and operations support functions

#### Course outline

- 5.1 Industrial engineering and productivity improvement
- 5.2 Quality, inspection, metrology, & maintenance
- 5.3 Lean and waste management
- 5.4 Continuous improvement



#### Learning outcomes

- Explain the role of industrial engineering in a manufacturing environment;
- Define productivity; name the resources, and discuss how productivity influences the wealth of a nation;
- Name the component parts of work study; briefly describe the procedure for a work study investigation;
- Distinguish between quality, inspection, and metrology; explain why quality is everyone's responsibility;
- Name and give a brief explanation of the types of plant maintenance activities in a manufacturing organization;
- Describe the lean process; explain how lean is used to increase the productive use of a company's resources;
- Identify the types of waste; give examples of each waste from the workplace;
- With the aid of sketches, give an explanation of the seven basic quality tools; give one example of the application of each.

#### Exam content

This module examines industrial engineering support and introduces a range of industrial engineering support activities necessary for the successful operation of a manufacturing company.

The role of productivity, work study, and ergonomics in improving the productive use of a company's manufacturing resources is discussed, with example given on how to increase productivity utilizing work study and ergonomics.

The module examines the role of quality, inspection, metrology and planned maintenance in manufacturing, and examines how each is utilized in the providing quality cost-effective goods and services.

The module examines lean, waste, and continuous improvement and introduces the key components of lean, waste, and continuous improvement. Lean and lean thinking is examined, outlining how lean can be used to improve the productive use of a company's limited resources.

Different forms of waste [muda] are identified and a number of suggestions on how to minimize waste in the value chain are given.

The module introduces the process of continuous improvement and describes a number of different quality tools and continuous improvement techniques.

# Key terms

Learners wishing to achieve the certification in "Certified Production and Inventory Analyst" should familiarize themselves with the following terms. The glossary of Term accompanying this program provides an explanation of each term.

## 1-10

5S-CANDO  
7+1 wastes

## A

ABC classification  
Accounting  
Action messages  
Allowances  
Articles of Association  
As-built bill of material  
Assemble-to-order  
Assembling processes  
Autocratic leader

## B

Backlog  
Bill of materials [BOM]  
Bill of material structure  
Bill of resources  
Breadboard model  
Business goals  
Business culture

## C

Capacity requirements planning [CRP]  
Capital  
Carrier  
Casting and molding  
Categories of inspectors  
Ceramic materials  
Chain of suppliers  
Channels of distribution  
Chase production planning strategy  
Comfort zone  
Commercial waste  
Communications  
Companies Act  
Competition  
Competitive market  
Composites  
Conditioning processes  
Conformance to specification  
Continuous improvement  
Continuous production systems

Contract warehouses  
Control equipment  
Controlled waste  
Controlling  
Corporate strategy  
Cumulative lead-time [CLT]  
Custom designed  
Customer base  
Customer service levels [CSL]  
Cycle counting

## D

Data  
Decision-making  
Deed of partnership  
Defect (S)  
Defect waste  
Degree of control  
Demand  
Demand forecasting  
Demand management  
Democratic leader  
Demonstrated capacity  
Descriptive studies  
Design  
Dictator  
Directive waste  
Distribution  
Distribution inventories  
Doable schedule

## E

Efficiency  
Employee empowerment  
Employee involvement  
Employees  
Engineering  
Engineering materials  
Engineer-to-order [ETO]  
Environmental engineering  
Equipment productivity  
Ergonomic improvements  
Ergonomics  
Exception messages  
Extension strategies  
Extra processing waste

## F

Fabrication  
Factory planned orders  
Feedback loop  
Ferrous metals  
Final assembly schedule [FAS]  
Finance  
Financial incentives  
Finishing processes  
First-off  
Fitness for purpose  
Fixed-position layout  
Flow-shop  
Focus forecasting  
Forecasting  
For-hire carriers  
Forming processes  
Form utility  
Fourth-party logistics provider [4PL]  
Free-reign leader  
Functional layout  
Functions of inventories

## G

Galvanizing  
General public  
General-purpose equipment  
Global market  
Goal-management  
Goals  
Goods  
Goods availability  
Goods' receiving process  
Gross requirements

## H

Handicraft era  
Health and safety  
Health and safety engineer  
Household waste



Human capital  
Human factor engineering  
Humanities  
Hybrid production planning strategy

**I**

Incorporated businesses  
Indented bill of material  
Industrial engineering  
Industrial engineers  
Industrial Revolution  
Industrial waste  
Informal organization  
Information  
Inorganic materials  
Input-output control  
Input-output report  
Inputs  
Inspection  
Inspection activity  
Inspection stations  
Intermittent production  
Inventory  
Inventory management  
Inventory record accuracy  
Inventory waste  
Item  
Item data  
Item record

**J**

Jidoka  
Job production  
Job relatedness  
Job satisfaction  
Job shop

**K**

Kaizen  
Kanban  
Key performance indicators [KPIs]  
Knowledge

**L**

Labour productivity  
Leading  
Lean initiatives  
Lean philosophy  
Legal identity  
Level production planning strategy  
Levels of inspection  
Limited [Ltd] company  
Limited liability  
Liquid assets  
Load profile  
Logistics  
Long-range planning

**M**

Machines  
Maintenance  
Make-to-order [MTO]  
Make-to-stock [MTS]  
Management functions  
Management processes  
Manpower  
Manufacturing  
Manufacturing inputs  
Manufacturing inventories  
Manufacturing lead-time [MLT]  
Manufacturing outputs  
Manufacturing processes  
Manufacturing [producer] environment  
Manufacturing team  
Marketing  
Market niche  
Mass production  
Master production schedule [MPS]  
Master scheduler  
Master scheduling  
Material flow cycle  
Material planner  
Materials planning process  
Material requirements planning [MRP]  
Materials  
Materials handling equipment [MHE]  
Materials management  
Medium-range planning  
Memorandum of Association  
Metallic materials  
Metrologist  
Mixed-model scheduling  
Modes of transport  
Motion waste  
MRP record  
Multi-skilling  
Multi-tasking

**N**

Negative feedback  
Net requirements  
Nonferrous metals  
Non-financial incentives  
Not-for-hire carrier

**O**

Observed time  
Occupational Health and Safety  
Administration [OSHA]  
Off-the-shelf  
Open data models  
Open order status  
Operations research [OR]

Order cycle  
Organizations  
Original equipment manufacturer [OEM]  
Outputs  
Overproduction  
Owners

**P**

Packaging materials  
Packaging waste  
Partners  
Part number  
PDCA cycle  
Performance measures  
Periodic stocktake  
Personal protective equipment [PPE]  
Place utility  
Planning  
Planning factors  
Planning horizons  
Plant maintenance  
Polymeric materials  
Positioning equipment  
Primary material input  
Principles of lean production  
Private sector companies  
Private warehouses  
Process engineering  
Processes  
Processing logic  
Process layout  
Process production  
Process strategies  
Product development  
Product engineering  
Production  
Production activity control [PAC]  
Production planning  
Production planning and control [PPC]  
Production planning strategies  
Productive resources  
Productivity  
Productivity people  
Productivity ratio  
Productivity trends  
Product layout  
Product mix  
Product positioning strategies  
Product-process matrix

Product volume  
 Profitability  
 Proprietary limited [Pty] Ltd. companies  
 Protective packaging  
 Public sector companies  
 Public warehouses  
 Purchase planning and control  
 Purchasing  
 Purchasing cycle

**Q**

Quality assurance [QA]  
 Quality circles [QCs]  
 Quality control [QC]  
 Quality control and inspection  
 Quality management  
 Quality of work-life [QWL]

**R**

Rated capacity  
 Recycling  
 Resource planning  
 Resources  
 Relaxation allowances  
 Rough-cut capacity planning [RCCP]  
 Routing file

**S**

Scheduled receipt  
 Scheduling rules  
 Science  
 Secondary processing  
 Self inspection  
 Separating processes  
 Seven basic quality tools  
 Seven wastes

Shareholders  
 Shop calendar  
 Short-range planning  
 Single-level bill of material  
 Single-minute exchange of dies [SMED]  
 SKU  
 Societal goals  
 Sole proprietor  
 Special category warehouse  
 Specialization  
 Special-purpose equipment  
 Special waste  
 Specification  
 Standardized work  
 Standard operating procedures [SOPs]  
 Standards  
 Standard time  
 Storage equipment  
 Strategic decision-making  
 Subassembly  
 Subcontract  
 Subcontracting production planning strategy  
 Summarized bill of material  
 Supplier relationships  
 Supplier selection  
 Supply pipe  
 Support functions  
 Swarf  
 System goals  
 Systemic errors

**T**

Tactical decision-making  
 Targets  
 Technology  
 Technology systems  
 Third-party logistics provider [3PL]  
 Theoretical capacity  
 Time-based maintenance

Time-span  
 Time utility  
 Total quality management [TQM]  
 Transformation process  
 Transportation  
 Transport company  
 Transport equipment  
 Transport waste  
 Tree structure  
 Types of ergonomics  
 Types of inventory

**U**

Under-utilized people waste  
 Undesirable outputs  
 Unincorporated businesses  
 Unit loads  
 Utilities  
 Utilization

**V**

Value analysis  
 Value engineering  
 Value stream  
 Voice of the customer [VOC]

**W**

Waiting waste  
 Warehousing activities  
 Waste  
 Waste elimination  
 Work centre load report  
 Work centres  
 Work content  
 Work environment  
 Workforce  
 Work measurement techniques

**XYA**

Cross-functional team  
 Yard management system  
 Zero emissions vehicle

# Sample questions

The sample questions included here are similar in format to the questions contained in the final exam.

These questions are included to enable you to become familiar with the approach to answering questions that you will encounter when you take the exam. Remember these are only sample questions and your score in this sample should not be interpreted as your potential for successfully achieving a pass in the final exam.

Select the most correct answer for each of the following multiple choice questions.

When answering multiple choice questions do the following: Read the question, read the question again underlining the key words and eliminating any definite wrong answers. Read the question again. Remember there is no negative marking, so if in doubt at least take your best shot.

Indicate your answer by circling the appropriate letter, a, b, c, or d.

## Question No. 1

Which is **NOT** an incorporated business?

- a. Personal liability company.
- b. Limited partnership.
- c. Private limited company.
- d. Limited company.

## Question No. 2

Which statement regarding "flows" within the supply chain is **CORRECT**?

- a. Goods flow from customers to suppliers.
- b. Demand flows from suppliers to customers.
- c. Information flows in both directions.
- d. Each of the above statements is correct.

## Question No. 3

Which product positioning strategy has the longest customer lead-time?

- a. Engineer-to-order.
- b. Make-to-order.
- c. Assemble-to-order.
- d. Make-to-stock.

## Question No. 4

Which is **NOT** a qualitative forecasting technique?

- a. Delphi method.
- b. Exponential smoothing.
- c. Executive opinions.
- d. Consumer surveys.

**Question No. 5**

Which is the **CORRECT** action to take when load exceeds capacity?

- a. Reduce load and reduce capacity.
- b. Increase load and reduce capacity.
- c. Reduce capacity or increase load.
- d. Increase capacity or reduce load.

**Question No. 6**

Which are examples of intermittent production systems?

- a. Job production and batch production.
- b. Job production and repetitive production.
- c. Repetitive production and process production.
- d. Process production and batch production.

**Question No. 7**

The type of maintenance that is "condition-based" is:

- a. Periodic maintenance.
- b. Preventive maintenance.
- c. Breakdown maintenance.
- d. Predictive maintenance.

**Question No. 8**

Which business function is responsible for getting the finished goods to customers?

- a. Distribution management.
- b. Materials management.
- c. Production planning and control.
- d. Marketing management.

**Question No. 9**

Each is a type of materials transport equipment **EXCEPT**:

- a. Conveyors.
- b. Hoists.
- c. Industrial trucks.
- d. Cranes.

**Question No. 10**

Which is **NOT** a sub-category of controlled waste?

- a. Industrial waste.
- b. Commercial waste.
- c. Directive waste.
- d. Household waste.



# Answers to sample questions

## Question No. 1

Which is **NOT** an incorporated business?

- a. Personal liability Company.
- b. Limited partnership.**
- c. Private limited company.
- d. Limited company.

## Explanation

Incorporated businesses are a class of business in which the business has an identity that is separate from its owners, and should the business be sued the owners themselves are protected from debt payment.

A private limited company is a state-authorized business structure that has state-specific regulations; composed of members, who are the owners.

A limited partnership is an unincorporated business set up by a number of individuals to conduct similar business;

some of the members contributing financially, but take no active part in the day-to-day running of the business. These partners are known as "sleeping" partners.

A personal liability company is a state-authorized business structure that falls under state-specific regulations that is composed of members, who are the owners.

## Question No. 2

Which statement regarding "flows" within the supply chain is **CORRECT?**

- a. Goods flow from customers to suppliers.
- b. Demand flows from suppliers to customers.
- c. Information flows in both directions.**
- d. Each of the above statements is correct.

## Explanation

Demand "flows" from the customer back to the supplier base; supply follows the route from supplier to customer.

For a supply chain to perform efficiently reliable information needs to "flow" in both directions.

**Question No. 3**

Which product positioning strategy has the longest customer lead-time?

- a. **Engineer-to-order.**
- b. Make-to-order.
- c. Assemble-to-order.
- d. Make-to-stock.

**Explanation**

With an engineer-to-order strategy time is required to design the goods for specific customers, procure the necessary materials, make the goods, and then ship the goods to the customer.

With a make-to-order strategy time is required to procure the materials, make the goods and ship the goods to the customer.

An assemble-to-order product positioning strategy requires time to finish the goods, making use of the final assembly schedule [FAS] and then shipping the goods to customers.

A make-to-stock product positioning strategy has the shortest customer lead-time - ship the goods to customers. Here the goods are produced and held in the finished goods warehouse until requested by a customer or end user.

**Question No. 4**

Which is **NOT** a qualitative forecasting technique?

- a. Delphi method.
- b. **Exponential smoothing.**
- c. Executive opinions.
- d. Consumer surveys.

**Explanation**

The Delphi method is a group technique in which a panel of experts is questioned individually about their perceptions of future events.

Exponential smoothing is a quantitative forecasting technique using historical data - weighted to favour the most recent information.

Executive opinion uses the subjective views of

company executives or external subject matter experts to generate a forecast relating to future sales.

Consumer surveys use a company's own market surveys regarding specific consumer purchases. Surveys may consist of telephone contacts, personal interviews, or questionnaires. Each is a means of obtaining data.

**Question No. 5**

Which is the **CORRECT** action to take when load exceeds capacity?

- a. Reduce load and reduce capacity.
- b. Increase load and reduce capacity.
- c. Reduce capacity or increase load.
- d. **Increase capacity or reduce load.**

**Explanation**

The correct action to take when load exceeds capacity is to increase capacity or reduce load. Increasing capacity requires the provision of additional resources. The way to reduce load is to make fewer of the same items or reduce the total number of jobs in the system at that time.

Each of the other suggested answers would only aggravate the situation by either having too much load available, too little load available, too little capacity with which to execute the master production schedule, or too much capacity. The outcome achieved would depend on the action taken at a particular time.

**Question No. 6**

Which are examples of intermittent production systems?

- a. Job production and batch production.**
- b. Job production and repetitive production.
- c. Repetitive production and process production.
- d. Process production and batch production.

**Explanation**

Job production and batch production are both examples of intermittent production, usually associated with a high variety - low volume product mix. These industries produce their goods and services against a make-to-order or an engineer-to-order product positioning strategy. They employ a fixed-location layout or a functional layout.

Repetitive production and process production are examples of continuous production, where the volumes are high and the product variety is relatively low. With this type of production the product positioning strategy is make-to-stock or assemble-to-order. Here use is made of flow production techniques to produce the outputs.

**Question No. 7**

The type of maintenance that is "condition-based" is:

- a. Periodic maintenance.
- b. Preventive maintenance.
- c. Breakdown maintenance.
- d. Predictive maintenance.**

**Explanation**

Periodic maintenance is a type of time-based maintenance consisting of periodically inspecting, servicing, cleaning equipment, and replacing parts so as to prevent sudden failure and process-stability problems.

Preventive maintenance attempts to "prevent" failure through the prevention of deterioration, periodic inspection, or equipment condition diagnosis.

Breakdown maintenance is a type of maintenance where maintenance personnel wait until the equipment fails and then repair or replace it - depending on the extent of the breakdown.

Predictive maintenance ensures every piece of equipment in a production process is always able to perform its required task. This allows production to continue without interruptions.

**Question No. 8**

Which business function is responsible for getting the finished goods to customers?

- a. Distribution management.**
- b. Materials management.
- c. Production planning and control.
- d. Marketing management.

**Explanation**

Distribution management has the responsibility of getting goods to market, utilizing one of the available modes of transport, and making the correct selection of carrier.

Materials management has the responsibility of ensuring materials are available at the time they are needed; and that these materials are made available in the quantities requested.

Production planning and control schedule work for each of the production facilities and then manage the progress and completion of that work.

Marketing management has the role of determining the market for a company's goods and services, then satisfying that demand through sales.

**Question No. 9**

Each is a type of materials transport equipment **EXCEPT**:

- a. Conveyors.
- b. Hoists.**
- c. Industrial trucks.
- d. Cranes.

**Explanation**

There are three types of transport equipment frequently used in a warehouse environment; conveyors, cranes, and industrial trucks.

Conveyors are a horizontal, inclined, or vertical device for moving or transporting bulk material, packages, or objects in a path predetermined by the design of the device, and having points of loading and discharge, fixed or selective.

Hoists are classified as a piece of positioning equipment. Other forms of positioning equipment include air-film device, balancers, ball transfer tables, lift-and-tilt tables, parts feeders, and rotary index tables.

Industrial trucks include wheeled vehicles used in the factory, warehouse or distribution centre, in the dock area, [and in some cases also in the yard or on construction sites], to pick up, transport, and deposit single loads.

Cranes are machines for lifting or lowering a load and moving it horizontally. Drives may be manual, powered, or a combination of both.

**Question No. 10**

Which is **NOT** a sub-category of controlled waste?

- a. Industrial waste.
- b. Commercial waste.
- c. Directive waste.**
- d. Household waste.

**Explanation**

Directive waste includes any substance or object which the producer or the person in possession of it discards, intends to discard, or is required to discard. This forms the basic definition of waste as we understand it in the workplace.

Controlled waste is waste subject to legislative control in both its handling and disposal.

Controlled waste encompasses all forms of household, industrial and commercial waste - or any other such waste that has no future economic value attached to it.



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