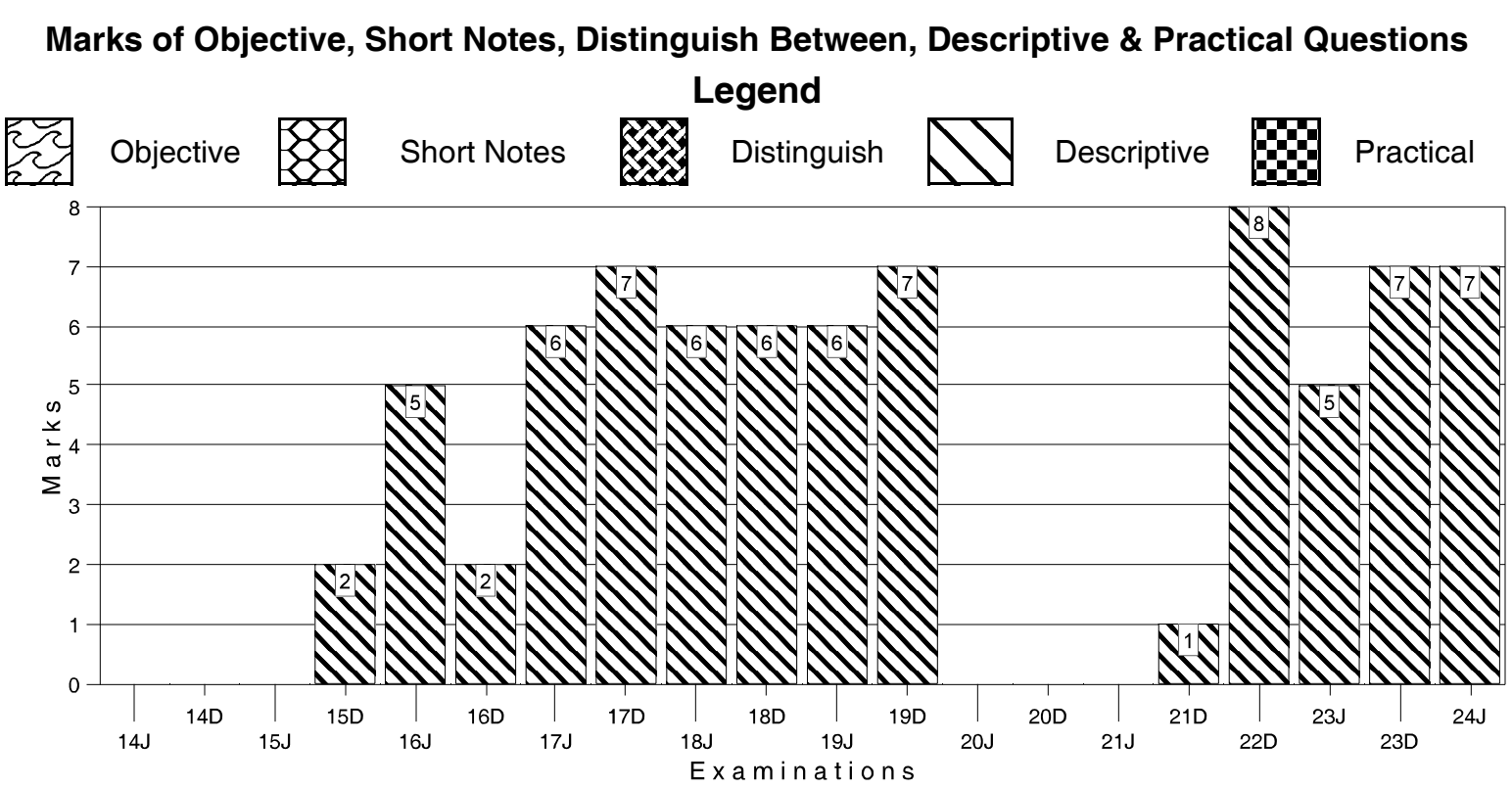
Marks of Objective, Short Notes, Distinguish Between, Descriptive & Practical Questions



1 OPERATIONS MANAGEMENT- INTRODUCTION

THIS CHAPTER INCLUDES

1. Scope
2. Characteristics of Modern Operations Functions
3. Recent Trends in Production and Operations Management

CHAPTER AT A GLANCE

1. Operations Management- Introduction

Operations management is the management of that part of an organization that is responsible for producing goods and/or services. There are examples of these goods and services all around you. Every book you read, every video you watch, every e-mail you send, every telephone conversation you have, and every medical treatment you receive involves the operations function of one or more organizations. So does everything you wear, eat, travel in, sit on, and access the internet with.

2. Objectives of Operations Management

(i) Customer service
(ii) Resource Utilization

3. Scope of Operation Management

1. Location of facilities.
2. Plant layouts and Material Handling.
3. Product Design.
4. Process Design.
5. Production and planning control.

6. Quality control. 7. Materials management. 8. Maintenance management.
4. Characteristic of Modern Operations Function
1. Manufacturing as Competitive Advantage 2. Services Orientation 3. Disappearance of Smokestacks 4. Small has become beautiful
5. Recent Trends in Production/Operations Management
1. Global Market Place 2. Production/Operations Strategy 3. Total Quality Management (TQM) 4. Flexibility

DESCRIPTIVE QUESTIONS

2015 - Dec [1] Answer the question:

(a) Identify four principal functions of an operating system with reference to Operation Management. **(2 marks)**

Answer:

An Operating System is defined as a configuration of resources combined for the provision of goods or services.

The function of an operating system is a reflection of the purpose it serves for its customers. The following four principal functions identified below also relate to the basic four operations done in any organization:

1. **Manufacture**	Manufacturing function is the one which involves some physical transformation, or a change in the form utility of the resources. Something is physically created and the output consists of goods which differ physically (e.g., in terms of form, content etc.) from those materials input to the system.

2. **Transport**	This function of operating system provides a change in the place utility of something or someone in order to satisfy customer. The customer, or something belonging to the customer, is moved from place to place and thus results in the change in location. There is no major change in the form of resources.
3. **Supply**	This function provides a change in the possession utility of a resource, i.e., the ownership or possession of goods in changed. Unlike manufacture, outputs of the system are physically same as the inputs.
4. **Service**	This function primarily results in a change in the state utility of a resource. The principal common characteristic is the treatment or accommodation of something or someone. The state or condition of the physical outputs will differ from the inputs as they have undergone same kind of treatment.

2016 - June [II] Answer the question:

1. (b) 'Operations management is responsible for producing goods and/or services.' In this context, define 'Operating System' and state the principal functions of an operating system. **(1+4 = 5 marks)**

Answer:

Please refer 2015 - Dec [1] (a) on page no. 13

2016 - Dec [1] (d) List categories of processes in a production system. **(2 marks) [Sec. A]**

Answer:

Basically, processes can be categorised as:

(i) **Conversion processes:** i.e., converting the raw materials into finished products (for example, converting iron ore into iron and then to steel). The conversion processes could be metallurgical or chemical or manufacturing or construction processes.

(ii) **Manufacturing processes:** Can be categorised into (a) Forming processes, (b) Machining processes and (c) Assembly processes.

(iii) **Testing processes:** Which involve inspection and testing of products (sometimes considered as part of the manufacturing processes.)

2017 - June [2] (a) 'An important objective of Operations Management is Resource Utilization'. Enumerate. Also list the scope of Operations Management. **(3 + 3 = 6 marks)**

Answer:

Resource Utilization

Another major objective is to utilize resources for the satisfaction of customer wants effectively, i.e., customer service must be provided with the achievement of effective operations through efficient use of resources. Inefficient use of resources or inadequate customer service leads to commercial failure of an operating system.

Operations management is concerned essentially with the utilization of resources, i.e., obtaining maximum effect from resources or minimizing their loss, under utilization or waste. The extent of the utilization of the resources' potential might be expressed in terms of the proportion of available time used or occupied, space utilization, levels of activity, etc. Each measure indicates the extent to which the potential or capacity of such resources is utilized. This is referred as the objective of resource utilization.

Operations management is also concerned with the achievement of both satisfactory customer service and resource utilization. An improvement in one will often give rise to deterioration in the other. Often both cannot be maximized, and hence a satisfactory performance must be achieved on both objectives. All the activities of operations management must be tackled with these two objectives in mind, and many of the problems will be faced by operations managers because of this conflict. Hence, operations managers must attempt to balance these basic objectives.

Scope of Operation Management

Operations Management concern with the conversion of inputs into outputs, using physical resources, so as to provide the desired utilities to the customer while meeting the other organizational objectives of effectiveness,

efficiency and adoptability. It distinguishes itself from other functions such as personnel, marketing, finance, etc. by its primary concern for 'conversion by using physical resources'. Following are the activities, which are listed under **Production and Operations Management Functions:**

1. Location of facilities
2. Plant Layouts and Material Handling
3. Product Design
4. Process Design
5. Production and Planning Control
6. Quality Control
7. Materials Management
8. Maintenance Management

2017 - Dec [2] (a) Briefly explain the characteristics of the modern production system. **(7 marks)**

Answer:

'The production management of today presents certain characteristics which make it look totally different from what it was during the past as follows:

1. **Manufacturing as Competitive Advantage:** In the past production was considered to be like any other function in the organisation. When the demand was high and production capacities were inadequate, the concern was to somehow muster all inputs and use them to produce goods which would be grabbed by market. But today's scenario is contrasting. Plants have excess capacities, competition is mounting and firms look and gain competitive advantage to survive and succeed. Production system offers vast scope to gain competitive edge and firms intend to exploit the potential. Total Quality Management (TQM), Time-Based Competition, Business Process Re-engineering (BPRE), Just-in-Time (JIT), Focused Factory, Flexible Manufacturing Systems (FMS), Computer Integrated Manufacturing (CIM), and The Virtual Corporation are some techniques which the companies are employing to gain competitive advantage.

2. **Services Orientation:** Service sector is gaining greater relevance these days. The production system, therefore, needs to be organised keeping in mind the peculiar requirements of the service component. The entire manufacturing needs to be geared to serve (i) intangible and perishable nature of the services, (ii) constant interaction with clients or customers, (iii) small volumes of production to serve local markets, and (iv) need to locate facilities to serve local markets. There is increased presence of professionals on the production, instead of technicians and engineers.
3. **Disappearance of Smokestacks:** Protective labour legislation, environmental movement and gradual emergence of knowledge based organisations have brought total transformation in the production system. Today's factories are aesthetically designed and built, environment friendly - in fact, they are homes away from homes. Going to factory every day is no more excruciating experience, it is like holidaying at a scenic spot.
4. **Small has Become Beautiful:** It was E.F. Schumacher who, in his famous book Small is Beautiful, opposed giant organisations and increased specialisation. He advocated instead, intermediate technology based on smaller working units, community ownership, and regional workplaces utilising local labour and resources. For him, small was beautiful. Businessmen, all over the world, did not believe in Schumacher's philosophy. Inspired by economies of scale, industrialists went in for huge organisations and mass production systems.

2018 - June [2] (a) Categorise the objectives of operations management and discuss about each category. **(2 + 4 = 6 marks)**

Answer:

Operations management is also concerned with the achievement of both satisfactory customer service and resource utilization. An improvement in one will often give rise to deterioration in the other. Often both cannot be maximized, and hence a satisfactory performance must be achieved on both objectives. All the activities of operations management must be tackled with these two objectives in mind, and many of the problems will be faced by operations managers because of this conflict. Hence, operations managers must attempt to balance these basic objectives.

- **Resource Utilization** Another major objective is to utilize resources for the satisfaction of customer wants effectively, i.e., customer service must be provided with the achievement of effective operations through efficient use of resources. Inefficient use of resources or inadequate customer service leads to commercial failure of an operating system. Operations management is concerned essentially with the utilization of resources, i.e., obtaining maximum effect from resources or minimizing their loss, under utilization or waste. The extent of the utilization of the resources' potential might be expressed in terms of the proportion of available time used or occupied, space utilization, levels of activity, etc. Each measure indicates the extent to which the potential or capacity of such resources is utilized. This is referred as the objective of resource utilization.
- **Customer Service** an operations objective reflects how fast the firm can respond to customer requests. The more enhanced operations cycles, the faster the firm can respond, the higher customer satisfaction then the more likely they will buy again. The aim is to speed up response, ensure dependability of delivery, and reduce costs through minimizing total inventory across the whole system. Fast operations cycles reduce the time between customer request and product delivery and hence increase the overall revenue of the firm.

2018 - Dec [2] Answer the following question:

(a) Explain the concept of Operating System in order to have a clear idea of Operations Management. **(6 marks)**

Answer:

In order to have a clear idea of Operations Management, one must have an idea of 'Operating Systems'.

An Operating System is defined as a configuration of resources combined for the provision of goods or services.

Retail organizations, hospitals, bus and taxi services, tailors, hotels and dentists are all examples of operating systems. Any operating system converts inputs, using physical resources, to create outputs, the function of which is to satisfy customers wants. The creation of goods or services involves transforming or converting inputs into outputs.

Various inputs such as capital, labour, and information are used to create goods or services using one or more transformation processes (e.g., storing, transporting, and cutting). To ensure that the desired output are obtained, an organization takes measurements at various points in the transformation process (feedback) and then compares with them with previously established standards to determine whether corrective action is needed (control).

It is important to note that goods and services often occur jointly. For example, having the oil changed in your car is a service, but the oil that is delivered is a good. Similarly, house painting is a service, but the paint is a good.

The goods-service combination is a continuum. It can range from primarily goods, with little service, to primarily service, with few goods. Because there are relatively few pure goods or pure services, companies usually sell product packages, which are a combination of goods and services. There are elements of both goods production and service delivery in these product packages. This makes managing operations more interesting, and also more challenging.

2019 - June [2] (a) List down various activities lying under Production and Operations Management function. **(6 marks)**

Answer:

Various Activities lying under Production and Operations Management functions:

(i) Location of Facilities.
(ii) Plant layouts and Material Handling.
(iii) Product Design.
(iv) Process Design.
(v) Production Planing and Control.
(vi) Quality Control.
(vii) Materials Management.
(viii) Maintenance Management.

2019 - Dec [2] (a) Enumerate the characteristics of a modern operations function. **(7 marks)**

Answer:

Please refer 2017 - Dec [2] (a) on page no. 16.

2021 - Dec [19] To provide the "right thing at the right price at the right time" can be closely associated with which objective of Operations Management? **(1 mark) [Sec. B - SAQ]**

Answer:

Customer service

2022 - Dec [2] (a) (i) Enumerate what are the Activities which are listed under the production and Operations Management functions. **(4 marks)**

Answer:

Following are the activities, which are listed under Production and Operations Management functions:

1. **Location of Facilities:** Plant location may be understood as the function of determining where the plant should be located for maximum operating economy and effectiveness.

   The selection of a place for locating a plant is one of the problems, perhaps the most important, which is faced by an entrepreneur while launching a new enterprise.

   A selection on pure economic considerations will ensure an easy and regular supply of raw materials, labour force, efficient plant layout, proper utilization of production capacity and reduced cost of production. An ideal location may not, by itself, guarantee success; but it certainly contributes to the smooth and efficient working of an organisation.

   A bad location, on the other hand, is a severe handicap for any enterprise and it finally bankrupts it. It is, therefore, very essential that utmost care should be exercised in the initial stages to select a proper place. Once a mistake is made in locating a plant it becomes extremely difficult and costly to correct it.

2. **Plant layouts and Material Handling:** Plant Layout, also known as layout of facility refers to the configuration of departments, work-centres and equipment and machinery with focus on the flow of materials or work through the production system.

   Plant layout or facility layout means planning for location of all machines, equipments, utilities, work stations, customer service areas, material storage areas, tool servicing areas, tool cribs, aisles, rest rooms, lunch rooms, coffee/tea bays, offices, and computer rooms and also planning for the patterns of flow of materials and people around, into and within the buildings. Layout planning involves decisions about the physical arrangement of economic activity centres within a facility. An economic activity centre can be anything that consumes space, a person or group of people, a machine, a work station, a department, a store room and so on. The goal of layout planning is to allow workers and equipments to operate more effectively.
3. **Product Design:** Production or operations strategy is directly influenced by product design for the following reasons:
   (i) As products are designed, all the detailed characteristics of each product are established.
   (ii) Each product characteristic directly affects how the product can be made or produced (i.e., process technology and process design) and
   (iii) How the product is made determines the design of the production system (production design) which is the heart of production and operations strategy.

   Further, product design directly affects product quality, production costs and customer satisfaction. Hence, the design of product is crucial to success in today's global competition. A good product design can improve the marketability of a product by making it easier to operate or use, upgrading its quality, improving its appearance, and/or reducing manufacturing costs. A distinctive design may be the only feature that significantly differentiates a product. An excellent design includes usability, aesthetics, reliability, functionality, innovation and appropriateness. An excellent design provides competitive advantage to

the manufacturer, by ensuring appropriate quality, reasonable cost and the expected product features. Firms of tomorrow will definitely compete not on price and quality, but on product design.

4. **Process Design:** Process Design is concerned with the overall sequences of operations required to achieve the product specifications. It specifies the type of work stations to be used, the machines and equipments necessary to carry out the operations.
   The sequence of operations are determined by:
   (a) the nature of the product,
   (b) the materials used,
   (c) the quantities to be produced and
   (d) the existing physical layout of the plant.
5. **Production Planning and Control:** The ultimate objective of production planning and control is to contribute to the profits of the enterprise. This is accomplished by keeping the customers satisfied through the meeting of delivery schedules.

   Further, the specific objectives of production planning and control are to establish the routes and schedules for work that will ensure the optimum utilization of raw materials, labourers, and machines to provide the means for ensuring the operation of the plant in accordance with these plans. Production planning and control is essentially concerned with the control of work-in-process. To control work-in-process effectively it becomes necessary to control not only the flow of material but also the utilization of people and machines.
6. **Quality Control:** Timely execution of orders will be meaningful when the quality of the output is not below expectations. To ensure quality, inspection should be conducted at different stages of manufacture. An ideal layout provides ample space to carryout inspection to ensure better quality control.
7. **Materials Management:** Materials management is a core function of supply chain management, involving the planning and execution of supply chains to meet the material requirements of a company or organisation. The primary purpose of materials management is to ensure

that manufacturers have all the raw materials they need to make goods. Materials management also focuses on ensuring that no components are wasted and optimizing inventory maintenance and management.

8. **Maintenance Management:** Maintenance management can be defined as the process of maintaining a company's assets and resources and its main objectives are controlling costs, controlling time, managing resources and ensuring regulatory compliance. It helps companies maintain their resources while controlling time and costs to ensure maximum efficiency of the manufacturing process, the utilities and related facilities.

2022 - Dec [2] (a) (ii) Recent trends in production/operations management relate to Global Competition and the impact it has on manufacturing firms. In this context list down what are the recent trends in production/operations management. **(4 marks)**

Answer:

Recent trends in production/operations management relate to global competition and the impact it has on manufacturing firms. Some of the recent trends are :

1. **Global Market Place :** Globalization of business has compelled many manufacturing firms to have operations in many countries where they have certain economic advantage. This has resulted in a steep increase in the level of competition among manufacturing firms throughout the world.
2. **Production/Operations Strategy:** More and more firms are recognizing the importance of production/ operations strategy for the overall success of their business and the necessity for relating it to their overall business strategy.
3. **Total Quality Management (TQM) :** TQM approach has been adopted by many firms to achieve customer satisfaction by a never-ending quest for improving the quality of goods and services.
4. **Flexibility :** The ability to adapt quickly to changes in volume of demand, in the product mix demanded, and in product design or in delivery schedules, has become a major competitive strategy and a competitive advantage to the firms. This is sometimes called as agile manufacturing.

5. **Time Reduction :** Reduction of manufacturing cycle time and speed to market for a new product provide competitive edge to a firm over other firms. When companies can provide products at the same price and quality, quicker delivery (short lead times) provide one firm competitive edge over the other.
6. **Technology :** Advances in technology have led to a vast array of new products, new processes and new materials and components. Automation, computerization, information and communication technologies have revolutionized the way companies operate. Technological changes in products and processes can have great impact on competitiveness and quality, if the advanced technology is carefully integrated into the existing system.
7. **Worker Involvement :** The recent trend is to assign responsibility for decision making and problem solving to the lower levels in the organisation. This is known as employee involvement and empowerment. Examples of worker involvement are quality circles and use of work teams or quality improvement teams.
8. **Re-engineering :** This involves drastic measures or break-through improvements to improve the performance of a firm. It involves the concept of clean-slate approach or starting from scratch in redesigning the business processes.
9. **Environmental Issues :** Today's production managers are concerned more and more with pollution control and waste disposal which are key issues in protection of environment and social responsibility. There is increasing emphasis on reducing waste, recycling waste, using less-toxic chemicals and using biodegradable materials for packaging.
10. **Corporate Downsizing (or Right Sizing) :** Downsizing or right sizing has been forced on firms to shed their obesity. This has become necessary due to competition, lowering productivity, need for improved profit and for higher dividend payment to shareholders.
11. **Supply-Chain Management:** Management of supply-chain, from suppliers to final customers reduces the cost of transportation, warehousing and distribution throughout the supply chain.
12. **Lean Production:** Production systems have become lean production systems which use minimal amounts of resources to produce a high

volume of high quality goods with some variety. These systems use flexible manufacturing systems and multi-skilled workforce to have advantages of both mass production and job production (or craft production).

2023 - June [2] (a) List down various major decision areas under Production and Operations management. (Any Ten) **(5 marks)**

Answer:

Major decision areas under Production & Operation Management:

1. Product selection
2. Facility Location selection
3. Demand Forecasting
4. Process selection & Layout decision
5. Capacity planning
6. Aggregate Planning, Master Production Schedule
7. MRP/MRP 1/DRP/ERP
8. Inventory Management
9. Supplier Selection/Sourcing
10. Process Management
11. Quality Management
12. Maintenance
13. Warehousing/Transportation
14. Reverse Logistics
15. Working Capital Management
16. Skill Management

2023 - Dec [2] (a) "Recent trends in Production and Operations Management related to global competition and the impact it has on manufacturing firms." In this context, state in brief the recent trends in production and operations management. (Any seven) **(7 marks)**

Answer:

Recent trends In production / operations management relate to global competition and the impact it has on manufacturing firms. Some of the recent trends are:

(1) **Global Market Place:** Globalisation of business has compelled many manufacturing firms to have operations in many countries where they

have certain economic advantage. This has resulted in a steep increase in the level of competition among manufacturing firms throughout the world.

(2) **Production / Operations Strategy:** More and more firms are recognizing the importance of production / operations strategy for the overall success of their business and the necessity for relating it to their overall business strategy.

(3) **Total Quality Management (TQM):** TQM approach has been adopted by many firms to achieve customer satisfaction by a never-ending quest for improving the quality of goods and services.

(4) **Flexibility:** The ability to adapt quickly to changes in volume of demand, in the product mix demanded, and in product design or in delivery schedules, has become a major competitive strategy and a competitive advantage to the firms. This is sometimes called as agile manufacturing.

(5) **Time Reduction:** Reduction of manufacturing cycle time and speed to market for a new product provide competitive edge to a firm over other firms. When companies can provide products at the same price and quality, quicker delivery (short lead times) provide one firm competitive edge over the other.

(6) **Technology:** Advances in technology have led to a vast array of new products, new processes and new materials and components. Automation, computerisation, information and communication technologies have revolutionised the way companies operate.

(7) **Worker Involvement:** The recent trend is to assign responsibility for decision making and problem solving to the lower levels in the organisation. This is known as employee involvement and empowerment **Examples** of worker involvement are quality circles and use of work teams or quality improvement teams.

(8) **Re-engineering:** This involves drastic measures or break-through improvements to improve the performance of a firm, It involves the concept of clean-slate approach or starting from scratch in redesigning the business processes.

(9) **Environmental Issues:** Today's production managers are concerned more and more with pollution control and waste disposal which are key issues in protection of environment and social responsibility.

(10) **Corporate Downsizing (or Right Sizing):** Downsizing or right sizing has been forced on firms to shed their obesity. This has become necessary due to competition, lowering productivity, need for improved profit and for higher dividend payment to shareholders.

(11) **Supply-Chain Management:** Management of supply-chain, from suppliers to final customers reduces the cost of transportation, warehousing and distribution throughout the supply chain.

(12) **Lean Production:** Production systems have become lean production systems which use minimal amounts of resources to produce a high volume of high quality goods with some variety.

2024 - June [2] (a) “The Production Management of To-day presents certain characteristics which make it look totally different from what it was during the past. Specifically, To-day’s production system is characterized by at least Four Features”. In this Context Summarize the Said Features. **(7 marks)**

Repeatedly Asked Questions		
No.	**Question**	**Frequency**
1.	Descriptive Question of: 15 - Dec [1] (a), 16 - June [II] 1. (b)	2 Times
2.	Enumerate the characteristics of a modern operations function. 17 - Dec [2] (a), 19 - Dec [2] (a)	2 Times
3.	"Recent trends in Production and Operations Management related to global competition and the impact it has on manufacturing firms." In this context, state in brief the recent trends in production and operations management. (Any seven) 22 - Dec [2] (a) (ii), 23 - Dec [2] (a)	2 Times

FOR NOTE