VPM's
DR VN BRIMS, Thane
Programme: MMS (2025-27)
First Semester Regular Examination December 2025

Course Name:	Operations Management	**Course Code**	**C-107**
Roll No.		**Marks**	**60**
Total No. of Questions	6	**Duration**	**2 Hour**
Total No. of printed pages	4	**Date**	**18.12.2025**

Course Outcome Statements:

CO1. RECALL basic concepts of operations management and cite its evolution
CO2. ASSOCIATE the concepts of operations management and connect with business scenarios
CO3. APPLY basic principles of operations management in production and operation functions
CO4. EXAMINE the problems related to operations management in day-to-day functioning
CO5. RECOMMEND tentative solutions to the problems related to operations management

Instructions: -			**Marks**	**BL**	**CO**
Q. No 1 (All Questions are Compulsory)					
Q. No.		**Questions**			
Q. 1		**Case/Case-let Study**			
		Phoenix Appliances is a long-established manufacturer of refrigerators and washing machines with a strong presence in the Indian market. The company experiences clear seasonality in demand, with sales rising sharply during the summer months when customers prefer to purchase cooling appliances, and again during the festive season when attractive promotional offers influence buying behaviour. For several years, Phoenix followed a Level Production Strategy, which meant maintaining a constant workforce as well as producing at a fixed monthly output irrespective of fluctuations in demand. The philosophy behind this approach was to ensure production stability, predictable labour deployment, and uniform utilisation of machines. To support high-demand periods while producing at a constant rate, the company relied on building and maintaining high inventory levels during low-demand months so that these stocked units could be used to serve customers during peak seasons. However, the Level Strategy created challenges. Because demand considerably dipped during the monsoon and winter months, the company generated excess finished goods inventory, which led to higher working capital blockage and rising warehousing expenditure. Even after carrying high inventory, the company struggled during sudden unanticipated spikes in demand—sometimes triggered by heat waves or competitive promotional campaigns from rival brands—leading to stockouts and delayed deliveries during the months when refrigerators and washing machines were in high demand. This occasional mismatch between available inventory and market demand resulted in late deliveries, customer dissatisfaction and loss of sales opportunities. In the previous financial year, Phoenix shifted to a Chase Production Strategy in an attempt to better align supply with			

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<tr><td></td><td></td><td>market fluctuations. Instead of building up inventory, the company scaled up production when demand increased by hiring temporary labour, authorising overtime and outsourcing sub-assemblies to external vendors. This strategy helped the company respond quickly to market needs and significantly reduced delivery lead time. Customer complaints dropped, sales conversion improved, and seasonal demand was fulfilled without depending solely on stored inventory. Nevertheless, the chase-based approach brought new drawbacks. Labour costs increased by nearly 28 percent due to overtime wages and payments to contractual workers. Reports of fatigue and dissatisfaction also surfaced among regular employees because of fluctuating shift schedules. In addition, operations became more complex as the supply chain and production schedules had to be continuously adjusted depending on market forecasts.
Currently, the management of Phoenix Appliances is re-evaluating its long-term production approach. The leadership team is unsure whether to continue the Chase Strategy, revert to the Level Strategy with planned inventory accumulation, or adopt a Hybrid Strategy that combines the stability of level production and core workforce with controlled capacity adjustments during seasonal spikes. The final decision must balance cost efficiency, employee morale, liquidity and inventory risk, operational smoothness, and customer service levels.</td><td></td><td></td><td></td></tr>
<tr><td></td><td>a.</td><td>Analyse the strengths and weaknesses of Level and Chase strategies in the context of Phoenix Appliances</td><td>5</td><td>Level 4</td><td>CO4</td></tr>
<tr><td></td><td>b.</td><td>Recommend the most suitable aggregate production approach for Phoenix with a justification</td><td>5</td><td>Level 5</td><td>CO5</td></tr>
<tr><td>Q. 2</td><td></td><td>Answer the following</td><td></td><td></td><td></td></tr>
<tr><td></td><td>a.</td><td>Consider a distribution network with three potentials retailers' locations: A, B, and C. The coordinates (in miles) of each location are as follows:
Retailer A: (20 Km, 50 km),
Retailer B :(80km, 30km)
Retailer C: (60 km, 70 km).
The volumes to be transferred to each retailer from warehouse is given below:
Retailer A: 5000 Qty,
Retailer B: 3000 Qty, and
Retailer C: 2000 Qty.
Determine the centre of gravity for this distribution network to locate the warehouse.</td><td>10</td><td>Level 5</td><td>CO5</td></tr>
<tr><td colspan="6">Or</td></tr>
<tr><td></td><td>b</td><td>A manufacturing firm processes five jobs through two machines in the same order — Machine 1 followed by Machine 2. The processing times (in hours) for each job on both machines are given below:<table><tr><td>Job</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Machine 1</td><td>13</td><td>2</td><td>1</td><td>4</td><td>5</td></tr><tr><td>Machine 2</td><td>3</td><td>5</td><td>3</td><td>6</td><td>7</td></tr></table></td><td>10</td><td>Level 5</td><td>CO5</td></tr>
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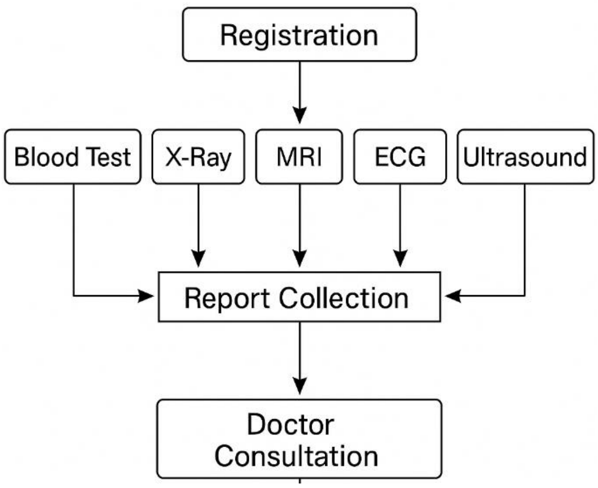
		Using Johnson's Rule for sequencing jobs on two machines, **determine** optimal job sequence that minimises the total make span and total time taken to complete all jobs (Elapsed Time).			
Q. 3		**Answer the following**			
	a.	An e-commerce company processes thousands of customer orders every day through its online platform. Once a customer places an order, the system validates payment, checks stock availability, triggers warehouse picking and packaging, schedules dispatch through logistics partners, and finally delivers the shipment to the customer. The order status is continuously updated on the customer portal at each stage, including "Order Placed", "Packed", "Shipped", "Out for Delivery", and "Delivered". **Analyze** the above and Draw a process flowchart for the *Order-to-Delivery* cycle in an e-commerce firm.	**10**	**Level 4**	**CO4**
		Or			
	b.	A multispecialty hospital follows a **process layout** in its diagnostic department: • Patients first register at the **Registration Counter** • Depending on symptoms, they are sent to **Blood Test**, **X-Ray**, **MRI**, **ECG**, or **Ultrasound**, located in different parts of the building • After tests, all patients move to **Report Collection** • Finally, they proceed to **Doctor Consultation**  This leads to **high patient movement**, **variable waiting times**, and **congestion** near certain test areas. **Analyse** how the existing Process Layout of the hospital's diagnostic center affects patient flow, waiting time variability, staff utilization, and operational efficiency. Based on your analysis, propose which changes in the layout or flow could improve overall service performance.	**10**	**Level 4**	**CO4**
Q. 4		**Answer the following**			
	a.	A manufacturing firm wants to optimise its ordering policy for a key raw material used throughout the year. The annual demand for the material is 24,000 units, the ordering cost per purchase order is ₹200, and the carrying cost per unit is ₹5. **Apply** the Economic Order Quantity (EOQ) model to **identify**: a) The Economic Order Quantity (EOQ) that should be ordered each time. b) The number of orders the company will place in a year based on the EOQ.	**10**	**Level 3**	**CO3**

Or					
	b.	Suppose that we are to produce product T, which is made of 2 parts U and three parts V. Part U is made of 1 part W, and 2 parts X. Part V is made of 2 parts of W and Two parts Y. **Built** Product Structure Tree and **Identify** quantities of U, V, X, Y and W if 100 units of T are required.	**10**	**Level 3**	**CO3**
Q. 5		**Answer the following**			
	a.	**Explain** various functions of Inventory. Summarize any two Inventory classification techniques of your choice.	**10**	**Level 2**	**CO2**
Or					
	b.	**Summarize** the contributions of Dr. Deming and Dr. Juran in quality management.	**10**	**Level 2**	**CO2**
Q. 6		**Answer the following**			
a	**i**	Recall PDCA Cycle and it's Benefits of using the same in manufacturing.	**5**	**Level 1**	**CO1**
	ii	What is Demand Forecasting? Recall qualitative forecasting methods.	**5**	**Level 1**	**CO1**
Or					
b	**i.**	Recall the difference between Goods and Services with suitable examples	**5**	**Level 1**	**CO1**
	ii	What do you mean by [Ans any two]: 1) Time Study 2) Work Method 3) WMS 4) 5S	**5**	**Level 1**	**CO1**