

PRODUCTION & OPERATIONS MANAGEMENT

(Mechanical Engineering)

Time: 3 hours

Max. Marks: 70

PART – A

(Compulsory Question)

- 1 Answer the following: (10 X 02 = 20 Marks)
- State any two differences between products and services?
 - Enumerate two aggregate planning strategies.
 - Where do we use the "Delphi" method for forecasting?
 - Explain "Tracking Signal".
 - Name two factors affecting facilities location.
 - What is "Group Technology Layout"?
 - Explain briefly the concept of Kanban system.
 - What is the difference between Line Balancing and Line of Balance?
 - What is Johnson's Rule for scheduling jobs?
 - What is meant by ABC classification?

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

- 2 What are the three basic principles in product development? Discuss them briefly.

OR

- 3
- What are the objectives of Aggregate Planning?
 - Differentiate between 'Pure' and 'Mixed Strategies in Aggregate Planning
 - What are 'Chase' and 'Level' strategies in Aggregate Planning?

UNIT – II

- 4
- What are the objectives / uses of forecasting?
 - Given tracking signal action limit = 4, compute tracking signal and comment.

Period	1	2	3	4	5	6
Actual demand	80	92	71	83	90	102
Forecast demand	78	79	83	79	80	83

OR

- 5 Compute the sales for the fifth year if corresponding $x = 90$. Calculate Using the regression method.

Year	1	2	3	4
x	40	48	66	78
Y sales units	30	32	40	52

UNIT – III

- 6 Differentiate between 'Product Layout' and 'Process Layout' with neat block diagrams.

OR

- 7 An Ambala producer needs to add a component sub-assembly operation that can produce 80 units during a regular shift of 8 hours. The operations involve three activities with times as shown below:

Operation	Activity	Std. Time (Min)
A	Mechanical assembly	12
B	Electrical wiring	16
C	Testing	3

- How many work stations (in parallel) would be required for each activity?
- If workers cannot be shifted from one operation to another, what is the appropriate percentage of idle time for this sub-assembly operation?

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UNIT – IV

8 Write notes on the following:

- (a) Just in Time concept.
- (b) SMED.
- (c) Kaizen
- (d) TQM
- (e) Six Sigma.

OR

9 Given the forecast requirements for end item Y shown below, complete the MRP. Note that a scheduled receipt of 60 units is due in period 2 and a safety stock of 25 is to be maintained. LT = 2 weeks and OQ = 60 units.

Materials Requirement Plan: Item Y											
Week	1	2	3	4	5	6	7	8	9	10	
Gross requirements	20	20	20	30	20	20	20	25	20	35	
Scheduled/planned Receipts		60									
On hand at end of period	50										
Planned order release											

UNIT – V

10 Differentiate between independent and dependent demand with help of sketches.

A local distributor for a national tire company expects to sell approximately 9600 steel-belted tires of a certain specification next year. Annual carrying cost is Rs. 1000 per tire and ordering cost is Rs. 5000. The distributor operates for 300 days in a year.

- (i) What is the Economic Order Quantity?
- (ii) What is the number of orders per year?
- (iii) What is the length of order cycle?

OR

- 11 (a) Give at least five reasons as to why inventories are needed.
- (b) What are inventory costs? Explain.

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