

22569

23124

3 Hours / 70 Marks

Seat No.

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- Instructions* – (1) All Questions are *Compulsory*.
- (2) Answer each next main Question on a new page.
- (3) Illustrate your answers with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. **Attempt any FIVE of the following:** **10**
- a) State any four factors affecting the plant location.
- b) State the types of production planning.
- c) Give classification of inventory system.
- d) Define the term work study.
- e) State advantages of Agile manufacturing.
- f) State the importance of Operation Research (OR).
- g) State different types of project management techniques.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Define production planning. Describe any one method of production planning.
 - b) State the different factors affecting on plant layout.
 - c) Differentiate between Time Study and Method Study.
 - d) State the different types of inventories and their function.
- 3. Attempt any THREE of the following:** **12**
- a) Explain the term Manufacturing Resource Planning (MRP-II).
 - b) State different types of production systems. Explain productivity and its significance.
 - c) Write the steps for designating the plant layout.
 - d) Explain sales forecasting. State the purpose and basic steps in forecasting.
- 4. Attempt any THREE of the following:** **12**
- a) Describe lean manufacturing concept in relation to features, advantages and limitations.
 - b) Define time study. State factors affecting the rate of working.
 - c) Draw any six therblings along with their defination, symbols and colors used.
 - d) Write the procedure of production planning from raw material to finish product in manufacturing industry.
 - e) Find Economic order quantity from following data:
Average annual demand = 50,000 units
Inventory carrying cost = 12% of unit value/year
Cost of placing an order = Rs. 80
Cost of unit = Rs. 5.

5. Attempt any TWO of the following:**12**

- Explain Economic Order Quantity (EOQ) with neat sketch in details.
- Explain 'SIMO' chart with application and 'MOST' with suitable examples.
- Find the standard time (S.T.) and number of pieces for a standard hour. If the normal cycle time for an operation is 1.45 minutes and it is estimated that 400 minutes of 480 minutes day are available to operator for production purposes.

6. Attempt any TWO of the following:**12**

- Compare Agile and Lean manufacturing.
- The activities needed to replace a broken window pane are given below:

Activity	Duration (In minutes)	Preceding Activities
A = Order Glass	10	–
B = Collect Glass	30	A
C = Remove broken pane	15	B, D
D = Buy Putty	20	–
E = Put putty in frame	3	C
F = Put in new pane	2	E
G = Putty outside and smooth	10	F
H = Sweep up broken glass	5	C
I = clean up	5	All

Draw network diagram and calculate critical path.

- c) A firm produces three products. These products are processed on three different machines. The time required to manufacture one unit of each of the three products and daily capacity of the three machines are given below in table.

Machine	Time per unit (Minutes)			Machine Capacity (minutes/day)
	Product-1	Product-2	Product-3	
M_1	2	3	2	440
M_2	4	–	3	470
M_3	2	5	–	430

It is required to determine the daily number of units to be manufactured for each product. The profit per unit product 1, 2 and 3 is Rs. 4, Rs. 3 and Rs. 6 respectively. It is assumed that all the amounts produced are consumed in the market. Formulate as a linear programming problem that Ts maximise the daily profit.
