

22569

22223

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) Assume suitable data, if necessary.
(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) Define productivity and briefly state its significance.
 - b) Enlist any four major factors that influence plant location.
 - c) Write four benefits of JIT.
 - d) Draw and describe four therblig symbols.
 - e) Write atleast four principles of Lean manufacturing.
 - f) Give four applications of Operation Research. Give full forms and state applications of following project management techniques
 - i) PERT
 - ii) CPM

P.T.O.

2. Attempt any THREE of the following **12**

- a) Enlist factors influencing plant layout.
- b) Describe any two techniques of improving productivity.
- c) Justify need of method study.
- d) Describe graphical method of Linear Programming.

3. Attempt any THREE of the following **12**

- a) Discuss different policies of inventory control, after classifying inventory into three groups A, B and C.
- b) Give list of various allowances considered in Calculating Standard Time.
- c) Describe advantages and limitations of lean manufacturing.
- d) A stationery manufacturing company sells and deliver office supplies to nearby companies, Schools and Colleges. Following table provides data for total no. of order received in last year.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
No.of orders	37	40	41	37	45	50	43	47	56	52	55	54

- i) Use exponential smoothing with smoothing parameter $\alpha = 0.3$ to calculate forecast or expected number of orders in January of next year.
- ii) Calculate forecast for January using above table, with smoothing parameter $\alpha = 0.5$.

4. Attempt any THREE of the following **12**

- a) Give examples of costs associated with inventory.
- b) Find EOQ (Economic Order Quantity) from following data.
Average annual demand = 40,000 units.
Inventory Carrying Cost = 10% of Unit Value/year.
Cost of placing an order = Rs. 60
Cost of unit = Rs. 3.
- c) Give list of functions of Production planning and Control system.
- d) Define :
 - i) Material requirement planning (MRP)
 - ii) Manufacturing Resource Planning (MRP-II)
- e) Give two advantages and two limitations of Agile manufacturing.

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

- a) Write features, advantages and limitations of each type of layout
 - i) Product
 - ii) Process.
- b) Define PPC and justify its importance.
- c) Draw and describe following charts by selecting suitable example:
 - i) Flow Process Chart
 - ii) Travel Chart

6. Attempt any TWO of the following

12

- a) A work sampling study was conducted for 50 hours in the machine shop in order to estimate Standard Time. The total no. of observations recorded were 2400. No working activity could be noticed for 400 observations. The ratio between manual and machine elements was 4:1. Average performance rating was estimated at 80% and the total no. of pieces produced during the period study were 100. Calculate standard time of the job assuming 20% as the relevant allowances.
- b) Briefly describe at least two principles of motion economy related with each of this group -
- i) Use of human body
 - ii) Arrangement of workplace
 - iii) Design of tools and equipments.
- c) A project consists of nine activities as shown ahead
- i) Draw network diagram
 - ii) Find Critical Path
 - iii) Find duration of project in no. of days.
 - iv) Find earliest and latest starting times.
 - v) Find earliest and latest finish times
 - vi) Find 'float time' for each activity.

Activity	Predecessor activity	Duration of activity (no. of days)
A	---	9
B	---	8
C	---	7
D	A	4
E	B	7
F	C	10
G	D	5
H	E, F	4
I	G, H	3