

December 2022
B.Tech. (ME) V SEMESTER
Industrial Engineering (PCC-ME-505-21)

Time : 3 Hours]

[Max. Marks : 75

Instructions :

1. *It is compulsory to answer all the questions (1.5 marks each) of Part-A in short.*
2. *Answer any four questions from Part-B in detail.*
3. *Different sub-parts of a question are to be attempted adjacent to each other.*

PART-A

1. (a) What do you mean by a production system? (1.5)
- (b) What are the factors that influence the selection of location for a plant? (1.5)
- (c) Differentiate between fixed cost and variable cost. (1.5)
- (d) Define work study. (1.5)
- (e) What are Therbligs? (1.5)
- (f) What is EOQ? (1.5)
- (g) What are the various costs associated with inventory? (1.5)

- (h) What is the objective of forecasting? (1.5)
- (i) State the functions of Master Production Schedule (MPS). (1.5)
- (j) What is Gantt chart? (1.5)

PART-B

2. (a) Discuss the various types of plant layout. (10)
- (b) A company produces 160 kg of plastic moulded parts of acceptable quality by consuming 200 kg of raw materials for a particular period. For the next period, the output is doubled (320 kg) by consuming 420 kg of raw material and for the third period, the output is increased to 400 kg by consuming 400 kg of raw material. Compute the productivity for first, second and third period. (5)
3. (a) ABC company plans to sell an article at a local market. The articles are purchased at 5 on the condition that all unsold articles shall be returned. The rent for the space is ₹ 2000. The articles will be sold at ₹ 9. Determine the number of articles which must be sold (a) To break-even, (b) To earn ₹ 400 as profit, (c) If the company sells 750 articles, calculate margin of safety and profit. (10)
- (b) Write short note on ISO standards. (5)

4. (a) The following table shows a time study data. The times shown are continuous watch readings in minutes. Initial setting of stop watch is at 0.00.

S. No.	Element	Cycle Time			Performance Rating
		1	2	3	
1	Get two cases	0.5	4.2	8.6	1.05
2	Put parts into cases	1.5	5.7	9.9	1.15
3	Clamp two parts in position	3.8	8.1	12.6	0.95

Take relaxation allowance as 15%. Find the standard time.

- (b) Explain the procedure for method study. (5)

5. (a) A manufacturer has to supply his customers 3600 units of his product per year. Shortages are not permitted. Inventory carrying cost amounts ₹ 1.2 per unit per annum. The set-up cost per run is ₹ 80. Find: (10)

- Economic order quantity.
- Optimum number of orders per annum,
- Average annual inventory cost (minimum),
- Optimum period of supply per optimum order.

- (b) Discuss the following selective inventory control techniques :

- ABC.
- FSN.

(5)

6. (a) The demand for the particular product is given for the last 8 periods. Compute the exponentially smoothed forecast for the periods taking $\alpha = 0.1$ and 0.3 . Which of these forecast is better? (10)

Period	1	2	3	4	5	6	7	8
Demand	10	18	29	15	30	12	16	8

- (b) What are the techniques used to find the forecasting errors? Explain in detail. (5)

7. Seven jobs are to be processed through 3 machines M_1 , M_2 and M_3 in the order M_1 , M_2 , M_3 . The processing time are given in hrs to process each one of the 3 jobs through all the machines. Find the optimal sequence of the jobs. Also find the minimum total elapsed time and idle time on M_2 and M_3 . (15)

Jobs	M_1	M_2	M_3
A	3	4	6
B	8	3	7
C	7	2	5
D	4	5	11
E	9	1	5
F	8	4	6
G	7	3	12