

[Total No. of Questions - 5] [Total No. of Printed Pages - 3]

Dec.-22-0304

ME-708 (Material Handling and Plant Layout)

B.Tech. 7th (CBCS)

Time : 3 Hours

Max. Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt all Five questions. Q. No. 1 to 4 are of 10 marks each and Q. No. 5 is of 20 marks.

SECTION - A

1. (a) State the objectives of a good plant layout.
- (b) State the advantages and disadvantages of group technology in plant layout. (10)

OR

What is product layout? Explain its salient features and state its advantages and disadvantages. (10)

2. Explain the procedure involved in CORE LAP for improving the layout. (10)

OR

- (a) Write about construction of string diagram.
- (b) You are given a line balancing problem with the following data (A, T, 6), (B, A, 3), (C, A, 4), (D, B and C, 8), (E, D, 10), (F, D, 4), (G, E and F, 8), Find a solution with minimum number of work stations for $T \leq 12$. Find the line efficiency and smoothness index. (10)

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3. (a) Explain the procedure of cost analysis of material handling systems.
- (b) What are the principles of material handling? Explain briefly with suitable examples. (10)

OR

Classify material handling equipment based on their applications in industries and explain each of them. (10)

4. What is crane? Classify cranes and write about at least two types of cranes in detail. (10)

OR

Consider the five points whose distance matrix is given in Table.

Table

| | 1 | 2 | 3 | 4 | 5 |
|---|----|----|----|----|----|
| 1 | - | 20 | 28 | 24 | 16 |
| 2 | 20 | - | 22 | 19 | 30 |
| 3 | 28 | 22 | - | 32 | 20 |
| 4 | 24 | 19 | 32 | - | 20 |
| 5 | 26 | 30 | 20 | 20 | - |

Assume that $p = 2$. Consider two out of the five points as medians and allocate the rest of the points to the medians. Find the solution. Is it optimal? What can happen if the number of points and number of groups increases? (10)

[P.T.O.]

5. Answer the following questions in brief (Compulsory):
- (i) List out the critical factors in selection of plant location.
 - (ii) What is line efficiency?
 - (iii) State any four material handling principles.
 - (iv) Draw a neat sketch of two wheel hand truck.
 - (v) State the various design factors involved in material handling.
 - (vi) What is string diagram? Explain.
 - (vii) Name the various tools used in layout planning.
 - (viii) Explain the flow process chart.
 - (ix) What do you understand by the abbreviations ADLAP, CORE LAP and CRAFT?
 - (x) What is line balancing? (10×2=20)