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(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2179 Roll No. | | | | | | | | | | |

B.Tech.

(SEMESTER-V) THEORY EXAMINATION, 2012-13

PLANT LAYOUT & DESIGN

Time : 2 Hours] *[Total Marks : 50*

Note : Attempt **all** questions.

1. Attempt any **four** parts : **3 × 4 = 12**

   (a) List the information needed during the data collection phase of plant layout.

   (b) Discuss any three factors needed for design of Manufacturing System.

   (c) List the factors affecting the location of plant layout.

   (d) Briefly discuss Ranking and Weight method for plant location.

   (e) Discuss with an example Virtual factory.

   (f) Write a note on HAZOP studies.

2. Attempt any **two** parts : **6 × 2 = 12**

   (a) Sketch the layout you will recommend for a Processing industry showing the locations of important machines and departments.

   (b) Explain the major considerations for location of textile industry in Mumbai and automobile industry in Faridabad.

   (c) Explain the significance of material flow in layout design with an example.

3. Attempt any **two** parts : **7 × 2 = 14**

   (a) Explain the Richard Muther's approach to Systematic Layout Planning.

   (b) Describe the classification of Material handling equipments and with example explain the characteristics of Overhead crane and Roller conveyors.

(c) A manufacturing unit has two plants at location A and B. These plants ship the parts to five distribution centres namely P, Q, R, S and T. These distribution centres in turn, supply to retail outlets. The cost of transportation of a single part varies from manufacturing unit to distribution centres. Table 1 provides the information of per unit cost from various sources to destinations. For example, from plant A to distribution centre P. The unit cost of transportation is ₹ 20 per unit. Moreover, Table 1 provides the information regarding the capacity of manufacturing units and demand of various distribution centres.

Table – 1 : Per-unit cost between various sources and destinations

	P	Q	R	S	T	Capacity	
Plant A	₹ 20	₹ 25	₹ 30	₹ 35	₹ 40	1000	
Plant B	₹ 40	₹ 35	₹ 30	₹ 25	₹ 20	1000	
Demand	600	400	300	500	700	2500	2000

Since the demand is more than the supply, the company is planning to install another unit with a capacity of 500 units at a different location to reduce the transportation cost as well as to meet the demand. Two new locations C and D are possible. The per unit transportation cost from plants C and D is given in Table 2 that the transportation cost is minimum ?

Table 2 : Per-unit cost between various sources and destinations

	P	Q	R	S	T	Capacity
Plant C	₹ 18	₹ 20	₹ 25	₹ 25	₹ 32	500
Plant D	₹ 20	₹ 31	₹ 22	₹ 21	₹ 15	500

Solve the problem by Using Vogel's approximation method and recommend which location the company should opt for, so as to minimize the total transportation cost. Calculate the transportation cost of the suggested location.

4. Attempt any **two** parts : **6 × 2 = 12**

(a) Describe the plant services needed for an oil refinery plant ? Explain the significance of effluent treatment of such plants.

(b) What are the factors considered while designing intelligent buildings and discuss the concept of intelligent buildings.

(c) Briefly discuss the Indian Factories Act.