

USN

--	--	--	--	--	--	--	--	--	--

10MA73

Seventh Semester B.E. Degree Examination, Aug./Sept.2020

**Facility Planning and Design**

Time: 3 hrs.

Max. Marks:100

**Note:** Answer any FIVE full questions, selecting at least TWO questions from each part.

**PART – A**

- 1 a. Explain the factors influencing plant location. (10 Marks)  
b. What is plant layout? Explain the principles of plant layout. (10 Marks)
- 2 a. Explain the principles of materials handling system. (10 Marks)  
b. Explain unit load concept in materials handling system. (10 Marks)
- 3 Explain the following computerized layout planning programs.  
a. CRAFT  
b. ALDEP (20 Marks)
- 4 a. Explain factors to be considered for space planning. (10 Marks)  
b. Explain the factors to be considered for area allocation. (10 Marks)

**PART – B**

- 5 a. Explain the methods of constructing the layout. (10 Marks)  
b. Explain the layout efficiency measurement indices for evaluating layouts. (10 Marks)
- 6 a. An entrepreneur wants to select a location for his business enterprise and he has conducted economy survey of two locations. The following is the details of his survey. Suggest him the best location.

Factors	Location 1	Location 2
	(cost in Rs. Lakhs)	
Land	1.0	0.90
Building	12.0	13.0
Water	0.05	0.06
Power	0.15	0.17
Labour	1.40	1.2
Incoming freight	1.20	1.10
Outgoing freight	1.60	1.50
Fuel	0.40	0.35
Raw materials	1.40	1.30
Taxes	0.04	0.02
Community facilities	Good	Excellent
Community attitude	Ok	Encouraging
Housing facility	Very good	Good
Cost of living	High	Normal
Community size	Small	Medium

(05 Marks)

- b. From the following data, select the most advantageous location for setting up a plant to manufacture electronic products.

Particulars	Site		
	x	y	Z
Total Investment (Rs.)	2,00,000	2,00,000	2,00,000
Expected Sales (Rs.)	2,50,000	3,00,000	2,50,000
Distribution expenses (Rs.)	40,000	40,000	75,000
Raw material expenses (Rs.)	70,000	80,000	90,000
Power and water supply charges (Rs.)	40,000	30,000	20,000
Wages and Salaries (Rs.)	20,000	25,000	20,000
Other expenses (rs.)	25,000	40,000	30,000
Community attitude	Indifferent	Need business	Indifferent
Housing facilities	Poor	Excellent	Good

(08 Marks)

- c. Explain single facility location problems with examples. (07 Marks)
- 7 a. Formulate a mathematical model for warehouse location problem. (10 Marks)
- b. Design a warehouse layout for the following data. The warehouse layout is as shown in Fig.Q7(b).

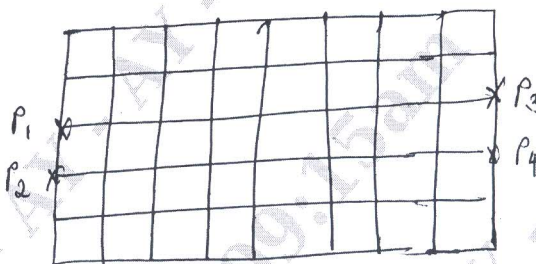


Fig.Q7(b)

Note: Cross marked indicate Docks  $P_1$ ,  $P_2$  size of each bay is  $20 \times 20$  ft. Storage bays are of size  $20 \times 20$  ft. Docks  $P_1$  and  $P_2$  are for truck delivery and docks  $P_3$  and  $P_4$  are for rail delivery. Dedicated storage is used. Sixty percent of all items movement in and out of storage is from/to either  $P_1$  or  $P_2$  with each dock likely to be used. Forty percent of all item movement in and out of storage is exactly divided between docks  $P_3$  and  $P_4$ . Three products A, B and C are to be stored in the warehouse with only one type product stored in a given storage bay. Product 'A' required 3600 sqft storage space and enters and leaves the storage space at a rate of 750 loads per month; Product 'B' requires 6400 sqft of storage space and enters and leaves storage at a rate of 900 load/month; Product 'C' requires a storage space of 4000 sqft of storage space and enters and leaves storage space at a rate of 800 loads/month. Use rectilinear travel and measure distance between centroids of storage bays. (10 Marks)

- 8 Explain the various phases involved in the implementation of facility plan. (20 Marks)

\* \* \* \* \*