College of Engineering, Pune

END SEMESTER EXAM Nov/Dec 2012

B.Tech. (Production Sandwich)

(PE -405)- (Facilities Planning and Design)

Day & Date- Monday 03/12/12 Max. Marks- 50

Timing- 2 PM to 5 PM Duration - 3 Hrs.

Instructions:

1. All questions carry equal marks
2. Solve any **SIX** questions.
3. Draw figures wherever necessary.

Q. 1 **A** Explain the procedure used for designing layout using PLANET **(5)**

b Explain the salient features of ALDEP layout design procedure. Explain the role of REL chart in the procedure **(5)**

Q. 2 **a** The Pattern of Systematic Handling Analysis is a step-by-step series of procedures to follow. Explain the steps carried out. **(5)**

b Explain the concept of unit load. Explain the major types of unit load formation equipments. **(5)**

Q. 3 **a** How REL chart is developed for different departments? Explain the procedure which will generate different layouts using REL chart. **(5)**

b Explain the objectives of space determination. State the advantages of space determination beforehand. **(5)**

Q. 4 Four hospitals located within a city are cooperating to establish a centralized blood bank facility that will serve the hospitals. The new facility is to be located such that distance traveled is minimized. Let four hospitals be located at $P_1(5,10)$, $P_2(7,6)$, $P_3(4,2)$, $P_4(16,3)$ with $w_1 = 450$, $w_2 = 1200$, $w_3 = 300$, $w_4 = 1500$. Determine the optimum location for a single new facility when cost is proportional to rectilinear distance. **(10)**

Q. 5 Three new facilities are to be located among five possible sites. The new facilities interact with four existing facilities. Site locations are Q1 = (0,0), Q2 = (10,0) Q3= (0,10) Q4= (10,0) Q5 = (20,5). Existing facilities are located at points P1 = (5,5), P2= (10,10), P3 = (0,5), P4 = (20,0). The flow between the new facility I and the existing facility k, w_{ik} is given as follows: **(10)**

	F1	F2	F3	F4
NF1	5	0	5	0
NF2	0	10	5	0
NF3	10	0	0	10

Determine the locations of new facilities that minimize the total distance traveled.

Q. 6 **a** A Company wishes to locate a maintenance facility in the city to service cars. The coordinate locations of the five offices are (0,0), (3,16), (18,2), (8,18) and (20,2). The number of cars transported per day between the new maintenance facility and the offices equal 5, 22, 41, 60 and 34 respectively. What location for the maintenance facility will minimize the distance cars are transported per day? **(5)**

b Explain the different functions carried out by warehouse. **(5)**

Q.7 **a** Explain the formulation of discrete location Assignment model. Explain how multiple facilities are located using this model. Why the flows are to be arranged in descending order and the distances in ascending order. Explain how lower bound and upper bound are calculated stating their significance. **(5)**

b Explain the principles used in shipping materials **(5)**