



**B.E. (Full-Time) DEGREE END SEMESTER EXAMINATIONS, APRIL 2011
INDUSTRIAL ENGINEERING BRANCH**

SIXTH SEMESTER

IE 9354 FACILITY LAYOUT AND MATERIAL HANDLING

Time : Three hours

Maximum : 100 marks

Answer ALL questions

PART A – (10 X 2 = 20 marks)

1. What is feasible set approach in location decision?.
2. How the network location problems are solved?
3. Differentiate between product layout and fixed position layout.
4. List down the any two of the need for layout study.
5. What is the concept of bond energy algorithm?
6. Contrast between CRAFT and ALDEP.
7. What are the advantages of COMSOAL?
8. How the Kilbridge and Wester method of line balancing works?
9. What are the functions of packaging?
10. What are the decision process steps in material handling selection?

PART B – (5 X 16 = 80 marks)

- 11 (i) Discuss about the factors affecting location decisions (8)
- (ii) Discuss the models of single facility location problem (8)
- 12 a) i) Explain the factors influencing facility layout (8)
- ii) What are the advantages of product and process layout (8)

(OR)

b) Describe the Systematic Layout Planning procedure with its flow diagram and suitable REL chart. (16)

13a) The Joy Job shop has requested that a new layout be designed for their operation in Salem, Tamilnadu. There are 12 departments involved. The department areas (in square feet) and activity relationships for the job shops are given below: Design a block layout using ALDEP algorithm.

Activity	Area (sq.ft)	
Office	600	I
Personnel Services	1000	U
Welding	800	U U
Press	900	A U U
Foundry	1200	U I E I U
Machining	1000	I U U E U U
Assembly	700	E U E U U U
Painting	500	E I E I I I
Steel storage	600	U A I I
Finished storage	1000	U I U
Other storage	800	U U
Maintenance	600	U

(OR)

b) The machine component incidence matrix is given below. Follow the steps of Rank Order Clustering (ROC) Algorithm and find the machine cells. (16)

Machine	Component						
	1	2	3	4	5	6	7
A	0	1	0	1	1	1	0
B	1	0	1	0	0	0	0
C	1	0	1	0	0	0	1
D	0	1	0	1	0	1	0
E	1	0	0	0	0	0	1

14a) Describe the basic materials handling equipments used in a chemical industry (16)

(OR)

b) List down and explain the classification of materials handling principles

15a) An electronic appliance is manufactured in an assembly line. The identical work is performed at more than one workstations. The assembly tasks, their performance times and precedence relationships are given below.

Task	Performance time (mins)	Immediate preceding task
1	1.1	--
2	0.4	1
3	0.5	1
4	1.1	1
5	0.3	2,3
6	0.4	4
7	3.2	5
8	0.8	6
9	0.7	7,8
10	0.3	9

The manufacturer desires an output of 400 units per 8 hour shift and stops the line for a 40 mins lunch break. Balance the line using COMSOAL (16)

(OR)

b) Write short notes on any two of the following

(i) Set covering problem

(ii) Location theory and models

(iii) Mixed model line balancing