B.E(Full Time) DEGREE END SEMESTER EXAMINATIONS, MAY 2013

INDUSTRIAL ENGINEERING

SIXTH SEMESTER

IE 9354– FACILITY LAYOUT AND MATERIALS HANDLING

(REGULATIONS 2008)

Time : 3 hr Max Marks : 100

Answer ALL questions

PART A – (10 X 2 = 20 Marks)

1. Write the feasible set approaches used for the location selection.
2. Plant location plays a major role in the design of production system. Why?
3. What is the objective of minimax location problem?
4. What are the steps suggested by Krick for the layout design process?.
5. When does a layout problem arise?
6. What is an improvement algorithm?
7. What are the factors reduces the productivity of a manual assembly line?
8. What are the technical issues related to mixed model assembly lines?
9. Write the objective of basic material handling system?
10. What are the various materials used for packaging?

PART B – (5 X 16 = 80 Marks)

11. A company is setting up an assembly line to produce 192 units per eight hour shift. The work elements, elemental time and immediate preceding elements are given below. Balance the line using the following line balancing technique.

    (i). Largest candidate method

    (ii). RPW method

Work element	Time (sec)	Immediate preceding element
A	40	-
B	80	A
C	30	D,E,F
D	25	B
E	20	B
F	15	B
G	120	A
H	145	G
I	130	H
J	115	C,I

12 a) The travel time between possible locations for ambulance stations and areas in a city are given below. .According to the Government policy, the ambulance station must be at most 30 minutes away from all population areas. Find the best location to achieve the policy. (16)

Areas

A	B	C	D	E	F	G
5	12	20	34	26	35	34
38	35	17	10	50	40	18
19	38	40	15	33	23	36
15	7	42	26	37	34	20
35	46	41	42	16	50	40

(OR)

12 b) (i) Describe the general formulation of a single facility location problem. (8)

(ii) Discuss the various factors affecting location decision. (8)

13 a) The Toy Job shop has requested that a new layout be designed for their operation in Karur, Tamilnadu. There are 12 departments involved.

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

I												
U	U											
U		U										
A	U		U									
I		U		U								
U	E		I		U							
I		E		U		U						
I	U		U		U		U					
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E	U		E		U		U		U			
I		U		I		I		U				
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The department areas and activity relationships for the job shops are given above. Design a block layout using ALDEP algorithm. (16)

(OR)

13.b) Explain the procedure of CRAFT algorithm with suitable diagram. (16)

14.a) Explain the Apple's and Nadler's layout design procedure (16)

(OR)

14 b) Explain the complete procedure of Systematic Layout Planning with suitable REL chart (16)

15 a) Explain the three classification of material handling equipments with suitable diagram (16)

(OR)

15b) Discuss the principles of materials handling system and its application area. (16)