

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VIII • EXAMINATION – SUMMER 2013****Subject Code: 182504****Date: 10/05/2013****Subject Name: Facilities Planning****Time: 10:30 am TO 01:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

Q.1 (a) Solve the following problem using appropriate algorithm.**07**

	7	7
7	A	B
7	C	D

Flow Matrix				
DEPT.	A	B	C	D
A	-	30	25	45
B	20	-	15	20
C	10	20	-	10
D	100	10	5	-

- Consider unit cost as Rs. 10.
- Prepare the distance matrix and cost matrix.
- Change the departments according to rules and find out the best layout from various departmental arrangements.
- Name the algorithm and state its methodology.

(b) Solve the following problem using appropriate algorithm.**07**

Department	Area in Sq. Units
A	1200
B	800
C	600
D	1200
E	800
F	1200
G	1200

The relationship matrix is as given below.

	A	B	C	D	E	F	G
A	-	E	O	I	O	U	U
B	E	-	U	E	I	I	U
C	O	U	-	U	U	O	U
D	I	E	U	-	I	U	U
E	O	I	U	I	-	A	I
F	U	I	O	U	A	-	E
G	U	U	U	U	I	E	-

- (i) Assume suitable units of squares.
- (ii) Assume suitable values of A, E, I, O, U and X
- (iii) Name the algorithm and write down the methodology.
- (iv) Which department will be in central position?

Q.2 (a) Prepare a Systematic Layout Planning for an industry of ten departments. Arrange the departments for optimum movements.**07**

- (b) Select a product and a process layout. Describe their significance, merits and demerits. Prepare a hybrid layout out of them and mention its significance, merits and demerits. **07**

OR

- (b) Which are the different varieties of the flow patterns? Give appropriate application of each of the flow patterns. Which flow pattern, according to you, will give higher output with minimum effort? **07**
- Q.3** (a) For which type of the industry, Rajkot is the best location? Justify your choice with appropriate reasons. If the plant is required to be shifted to Ahmedabad or Surat, Where it can be shifted for a successful run? Give reasons. **07**
- (b) Classify the material handling equipments. State the handling equipment requires for the following items- **07**
- (i) Sugar (ii) Patterns (iii) Melt (iv) Coal (v) Gas (vi) Glass bottles (vii) Sand (viii) Butter (ix) Medicines (x) Kerosene

OR

- Q.3** (a) Describe Single Stage Multi Machines System with a sketch. Where it is applicable in the industry? How it works? **07**
- (b) Describe Minimum Wage Act 1948. What are the significance of it? **07**
- Q.4** (a) State causes and sources of accidents. If a worker's hand is damaged in a lathe machine, what could be the possible reasons? What immediate action you will take? How the accident report will be prepared? **07**
- (b) What is depreciation? Classify it. Classify the methods of calculating depreciation. **07**
- An industrial plant with initial value of Rs. 200,000 and the salvage value of Rs. 20,000 at the end of 20 years, but is sold for Rs. 145,000 at the end of 10 years. What is the profit or loss if sinking fund depreciation at 8 % compound annually was adopted?

OR

- Q.4** (a) Describe the concept of unit load system. What is its significance? How the concept is useful in material handling system? **07**
- Q.4** (b) State the formulas used for calculating depreciation in each method. **07**
- Find depreciation annuity with a suitable method after 3 years, when the cost of machine is Rs. 8000 and scrap value is Rs. 4000 and rate of interest is 5%.
- Q.5** (a) What are the reasons for replacement of equipment? **07**
- Machine A operated manually costs Rs. 2000 has a life of 2 years. While an automatic machine B costs Rs. 3000 but has a life of 4 years. Operating cost of machine A is Rs. 4000 per year, while that of machine B is Rs. 3000 only. Which of the machine should be purchased? Consider 10 % interest.
- (b) Explain simulated annealing and genetic algorithm in brief. How they are useful in Facilities Planning? **07**

OR

- Q.5** (a) Which methods are used for replacement studies? **07**
- An existing piece of equipment has its market value of Rs. 10,000, maintenance cost is Rs. 1000 per year and has a life of 10 years and no salvage value and the interest rate is 10%. The proposed equipment has an installation cost of Rs. 100,000, maintenance cost of Rs 800 per year, a life of 50 years and the salvage value of Rs. 15,000. Suggest whether the proposed equipment should be purchased or not.

(b) Describe a Rank Order Cluster with following data.

(i) No. of departments $n = 9$

(ii) Their sequence is as given below.

COMPONENT NUMBER	SEQUENCE
A	1-2-3
B	6-7-8-9
C	4-5-6
D	3-5-4
E	7-8-6
F	5-6-4
G	2-4-3-5-6
H	9-8-6
I	8-7-9

Where this algorithm is applicable?
