Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 2724601 **Date: 25/05/2016**

Subject Name: Facility Planning & Design

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) Describe the following activities giving their application to layout planning. **07**

a) From to chart b) Activity relationship chart c) Facility location

(b) Develop a list of strategic issue that must be addressed in performing facilities planning for a) Hospital and b) Library **07**

Q.2 (a) What kind of manufacturing environments are the following types of layout designs are best suited for? **07**

i) Fixed position layout ii) Product layout iii) Process layout

(b) Let four existing facilities be located at P1 = (0, 0), P2 = (5, 0), P3 = (5, 5), P4 = (0, 5) with w1 = 2, w2 = 1, w3 = 2 and w4 = 2. Determine the optimum location for a single new facility as per following methodology: **07**

a) Minimize weighted sum of the rectilinear distance

b) Minimize weighted sum of the square of the Euclidean distance (gravity problem)

OR

(b) What is activity relationship chart? How it is constructed? **07**

Q.3 (a) An assembly operation consists of 10 tasks which must be completed in order from task 1 to 10. The respective task completion times in minutes are as follows: 0.5, 0.6, 0.5, 0.4, 0.4, 0.3, 0.4, 1.0, 0.5 and 0.4. Assume a 40 hour work week, a 95 % line efficiency and a desired production rate of 2000 units per week. **07**

a) What is the desired cycle time for the assembly line?

b) How many work stations will be required and what tasks are to be performed at each station?

c) Find out line efficiency and balance delay.

(b) Explain the following in brief: **07**

1. Employee services
2. Parking lots

OR

Q.3 **(a)** Distinguish between storage and warehousing department considering the similar activities carried. Why these departments must be planned together. **07**

(b) Explain the functions of receiving department. **07**

Q.4 **(a)** For each of the following material handling principles, a) Explain what it means and b) give a specific example of how it can be applied. **07**

i) Unit load principle
ii) Space utilization principle

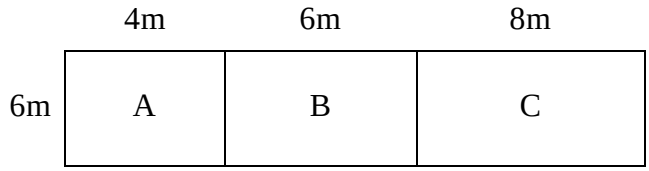
(b) List the symptoms of an inefficient material handling. Why material handling is significant? **07**

OR

Q.4 **(a)** Explain the factors affecting selection of material handling equipment's? **07**

(b) Under what circumstances you would suggest the following material handling equipment's: i) Conveyor ii) Crane iii) Industrial truck **07**

Q.5 **(a)** Consider the following initial layout with unit cost matrix. Use the CRAFT pairwise interchange technique to obtain the desirable layout. Assume suitable data if needed. **07**



Initial Layout

To / From	A	B	C
A	-	1	8
B	2	-	1
C	6	2	-

Flow matrix

(b) Write a note on activity relation chart with suitable diagram. **07**

OR

Q.5 (a) In a foundry, there are seven shops whose coordinates are (10, 20), (30, 40), (10, 120), (10, 60), (30, 100), (30, 140), (20, 190). The company is interested in locating a new costly firefighting equipment in the foundry. Determine the minimax location for the new equipment. **07**

Q.5 (b) For the machine part matrix shown below, form cells using clustering algorithm and, if conflicts exist, propose alternative approaches for resolving the conflicts. **07**

Part#	Machine #				
	1	2	3	4	5
1	1		1		
2		1		1	
3		1		1	1
4	1		1		
5		1			
6				1	1