GUJARAT TECHNOLOGICAL UNIVERSITY
MBA - SEMESTER–II • EXAMINATION – WINTER • 2014

Subject Code: 820007   **Date: 31-12-2014**

Subject Name: Research Methodology and Operation Research (RM&OR)

Time: 02:30 pm - 05:30 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)**	Explain with a diagram the sequences of a research process.	07
	(b)	Explain the six steps of management research hierarchy.	07
Q.2	**(a)**	Explain sources of primary data collection.	07
	(b)	Identify and explain the four major error sources when an instrument gives incorrect readings.	07

OR

	(b)	Identify the different types of non probability sampling.	07
Q.3	**(a)**	Identify the difference between type I and type II errors.	07
	(b)	Describe the assumptions for ANOVA and explain how they may be diagnosed.	07

OR

Q.3	**(a)**	Identify the difference between parametric and non parametric tests.	07
	(b)	Explain the different contents of a long technical research report	07
Q.4	**(a)**	Define Operations Research (OR). Identify the steps in solving OR problem.	07
	(b)	What is research design and identify its types. Briefly describe the exploratory type of research design.	07

OR

Q.4 **(a)** Identify the three components of a Linear Programming Problem. Explain different applications of Linear Programming Problem. **07**

(b) Write the dual of the following Linear Programming Problem: **07**

Minimize $Z_x = 3x_1 - 2x_2 + 4x_3$ subject to the constraints

(i) $3x_1 + 5x_2 + 4x_3 \geq 7$, (ii) $6x_1 + x_2 + 3x_3 \geq 4$, (iii) $7x_1 - 2x_2 - x_3 \leq 10$,

(iv) $x_1 - 2x_2 + 5x_3 \geq 3$, (v) $4x_1 + 7x_2 - 2x_3 \geq 2$ and $x_1, x_2, x_3 \geq 0$

Q.5 **(a)** A computer center which has three expert programmers, wants to develop three application programmes. The head of the center estimates the following time in minutes required by the three experts to develop the three programmes. **07**

		Programmers		
		A	B	C
Programmes	1	120	100	80
	2	80	90	110
	3	110	140	120

Assign the programmers to programmes in such a way that total time to develop programmes is minimum.

(b) Define PERT and CPM. How are they different from one another? **07**

OR

Q.5	**(a)**	Identify the steps of simulation process.	07
	(b)	Define reliability and validity. Explain three types of validity.	07

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