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. Make suitable assumptions wherever necessary. Figures to the right indicate full marks. **Q.1** (a) Explain with a diagram the sequences of a research process. **07** Explain the six steps of management research hierarchy. **07 (b) Q.2** Explain sources of primary data collection. 07 (a) Identify and explain the four major error sources when an instrument gives **(b)** 07 incorrect readings. OR Identify the different types of non probability sampling. **(b) 07** Q.3 (a) Identify the difference between type I and type II errors. 07 Describe the assumptions for ANOVA and explain how they may be diagnosed. **(b)** 07 OR Identify the difference between parametric and non parametric tests. **07 Q.3** (a) Explain the different contents of a long technical research report **07 (b)** Define Operations Research (OR). Identify the steps in solving OR problem. 07 **Q.4** (a) What is research design and identify its types. Briefly describe the exploratory 07 **(b)** type of research design. OR **Q.4** (a) Identify the three components of a Linear Programming Problem. Explain **07** different applications of Linear Programming Problem. Write the dual of the following Linear Programming Problem: **(b) 07** Minimize $Z_x = 3x_1 - 2x_2 + 4x_3$ subject to the constraints (i) $3x_1 + 5x_2 + 4x_3 \ge 7$, (ii) $6x_1 + x_2 + 3x_3 \ge 4$, (iii) $7x_1 - 2x_2 - x_3 \le 10$, (iv) $x_1 - 2x_2 + 5x_3 \ge 3$, (v) $4x_1 + 7x_2 - 2x_3 \ge 2$ and $x_1, x_2, x_3 \ge 0$ A computer center which has three expert programmers, wants to develop **07 Q.5** (a) three application programmes. The head of the center estimates the following time in minutes required by the three experts to develop the three programmes. **Programmers** C A В 120 100 80 1 **Programmes** 2 90 110 80 140 110 120 Assign the programmers to programmes in such a way that total time to develop programmes is minimum. Define PERT and CPM. How are they different from one another? **07 (b)** OR **Q.5** Identify the steps of simulation process. **07** (a) Define reliability and validity. Explain three types of validity. **(b) 07**
