

M.C.A. - I (2 Years) New CBCS Pattern Semester-I  
**PSMCAT104.1 - Paper-IV : Elective-I : Operational Techniques**

P. Pages : 2

Time : Three Hours



**GUG/W/23/13638**

Max. Marks : 80

- Notes :
1. All questions are compulsory and carry equal marks.
  2. draw neat and labelled diagram and use supporting data wherever necessary.
  3. Avoid vague answers and write specific answers related to questions.

**Either:**

1. a) Define operation research and explain the characteristics of. 8
- b) Explain the scope and limitations of operational research in brief. 8

**OR**

- c) What do you mean of mathematical modeling in operation research? 8
- d) Explain the phases of operation research in detail. 8

**Either:**

2. a) Explain the linear programming in detail using example. 8
- b) Describe the graphical solution model using example. 8

**OR**

- c) Explain the mathematical formulation of the LP problem. 8
- d) Solve the following LPP by the simplex method. 8
  - i) Maximise  $Z = 2x_1 + 4x_2$
  - ii) Subject to the constraints.  
 $x_1 + 2x_2 \leq 5$      $x_1, x_2 \geq 0$   
 $x_1 + x_2 \leq 4$

**Either:**

3. a) Explain transportation problem. Is this a linear programming problem? Explain. 8
- b) Describe the method of Norton-West corner Rule in detail. 8

**OR**

- c) Explain the flow chart of Hungarian Method. 8

- d) Find the minimum cost for the following transportation problem. 8

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Demand
A	6	1	9	3	70
B	11	5	2	8	50
C	10	10	4	7	90
Supply	85	35	50	45	

**Either:**

4. a) Explain the Methodology of PERT and PERT Analysis in brief. 8
- b) Write an Application of Network Techniques in detail? 8

**OR**

- c) Explain the Poisson Process and exponential distribution in detail. 8
- d) Explain the classification of Queuing model in detail. 8

5. Attempt all the questions.

- a) Define operational research. Write down different operational techniques. 4
- b) Explain the requirement application of linear programming. 4
- c) Describe Stepping stone method in detail. 4
- d) Explain the Methodology of CPM in brief. 4

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