

Master of Computer Application (MCA-II) Third Semester (Old)  
**MCA234 - Research Methodology & Operational Techniques Paper-IV**

P. Pages : 2

Time : Three Hours



GUG/W/18/2129

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.

1. Either

- a) Define Research. Give any four types of Research in detail. 8
- b) What do you mean by Research process? Explain about the criteria for good Research. 8

**OR**

- c) Explain in detail: 8
  - i) Defining Research Problem.
  - ii) Developing Research Proposal.
- d) Explain importance and Six P's of Research in detail. 8

2. Either

- a) What do you mean by decisions management of an quantitative techniques? Explain in detail. 8
- b) Explain following with context of measures of dispersion: 8
  - i) Range
  - ii) Mean deviation
  - iii) Standard deviation

**OR**

- c) Explain about Decision making under un- certainty in detail. 8
- d) What is moving average? Explain with example. 8

3. Either

Solve following LPP by simplex method.

- a)  $\text{Max } z = 2x_1 + 6x_2 + 4x_3$  8  
subject to constraint,  
 $x_1 - 2x_2 + 3x_3 \leq 9$   
 $3x_1 + x_2 + 2x_3 \leq 12$   
 $x_1 + 2x_2 + x_3 \leq 14$   
 $x_1, x_2, x_3 \geq 0$

- b) The owner of as mall machine shop has four machinists available to assign a job for the day. Fine jobs are offered with expected profit for each machinist on each job as follow: 8
  - i) Final the assignment of machinist to jobs that will result in maximum profit

Machinists	Jobs				
	A	B	C	D	E
1	62	78	50	101	82
2	71	84	64	73	59
3	87	92	111	71	81
4	48	64	87	77	80

**OR**

- c) What is CPM? Explain about CPM analysis in detail. 8
- d) What do you mean by Resource leveling and smoothing? Explain with giving sample example. 8

**4.** Either

- a) Give the objective and cost of inventories in detail. 8
- b) Find EOQ and total variable cost for following data: 8  
Annual demand = 25 units  
Unit price = Rs 2.50  
Order cost = Rs 4.00  
Storage rate = 1% per year  
Interest rate = 12% per year  
Obsolescence = 7% per year  
Compute the order quantity and the total variable cost that would result if an incorrect price Rs 1.6 used for the item.

**OR**

- c) Give and Explain the classification of during and Advantage of Querying theory. 8
- d) A dentist Schedule all her patient for 30 min appointment. Some of the patient takes more or less 30 min. depending on the type of dental work to be done. The following summary shows the various categories of work one given below. Simulate the dentist clinic for 4 hours and determine the avg. waiting time for the patient as well as idleness of the doctors. Assumed that all the patient show up at the clinic at exactly there schedule arrival time starting at 8 a.m. Use the following random no: 40 82 11 34 25 66 17 79 8

Category	Time req. in min	Probability
Filling	45	0.40
Crown	60	0.15
Cleaning	15	0.15
Extraction	45	0.12
Checkup	15	0.20

**5.** Solve all the questions

- a) Write note on sampling. 4
- b) Write a note on Regression Analysis. 4
- c) Write note on Network Analysis. 4
- d) Discuss about graphical representation of inventory process. 4

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