Roll No. | | | | | | | | | | | | **Total No. of Pages : 04**

Total No. of Questions : 10

MBA/MBA(IB) (Sem.–1)

QUANTITATIVE TECHNIQUES

Subject Code : MBA-103-18

M.Code : 75404

Date of Examination : 07-01-2025

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTION TO CANDIDATES :

1. **SECTION-A contains EIGHT questions carrying TWO marks each and students has to attempt ALL questions.**
2. **SECTION-B consists of FOUR Subsections : Units-I, II, III & IV. Each Subsection contains TWO questions each carrying EIGHT marks each and student has to attempt any ONE question from each Subsection.**
3. **SECTION-C is COMPULSORY carrying TWELVE marks.**

SECTION-A

1. Write short notes on the following :

(a) Mode

(b) Quartile Deviation

(c) Scatter Diagram

(d) Mutually Exclusive Events

(e) Poisson Distribution

(f) Big-M Method

(g) Two Person Zero Sum Game

(h) PERT.

SECTION-B

UNIT-I

2. Differentiate between measures of central tendency and measures of variation. Briefly describe the practical application areas of measures of central tendency and measures of variation.

3. Following information is given regarding the overall miles per gallon (MpG) of 2024 small SUVs :

   26, 22, 23, 21, 25, 24, 22, 26, 25, 22, 21, 21, 22, 22, 23, 24, 23, 22, 21 and 22 You are required to compute :

   (a) Compute the mean, median, and mode.

   (b) Compute the variance, standard deviation and range

UNIT-II

4. Differentiate between correlation and regression. Briefly describe the practical application areas of correlation and regression.

5. Consider the 80 households that purchased televisions that had a faster refresh rate. In the following table you see that 64 households are satisfied with their purchase and 16 households are dissatisfied.

Television Refresh Rate	**Satisfied with Purchase**		
	Yes	**No**	**Total**
Faster	64	16	80
Standard	176	44	220
Total	240	60	330

   Suppose 2 households are randomly selected from the 80 house, holds, you are required to find probability that both households are satisfied with their purchase.

UNIT-III

6. Define normal distribution. Discuss the various properties of normal distribution.

7. You are required to solve the following linear programming problem :

   Maximize $Z = 5X + 2Y$

   Subject to :

$$2X + 3Y \leq 420$$

$$4X + 6Y \leq 610$$

$$10X + 8Y \leq 125$$

$$X \text{ and } Y \geq 0$$

UNIT-IV

8. What do you mean by balancing an assignment problem? What steps you take to solve maximization case in assignment problem? Explain with suitable example.

9. The demand pattern for a product at for consumer centres, A, B, C and D are 5000 units, 7000 units, 4000 units and 2000 units respectively. The supply for these centres is from three factories X, Y and Z. The capacities for the factories are 3000 units, 6000 units and 9000 units respectively. The unit transportation cost in rupees from a factory to consumer centre is given below in the matrix. Develop an optimal transportation schedule and find the optimal cost.

	To			
From	**A**	**B**	**C**	**D**
X	8	9	12	8
Y	3	4	3	2
Z	5	3	7	4

SECTION-C

10. **Case-Study :**

At a local University, the Student Commission on Programming and Entertainment (SCOPE) is preparing to host its first rock concert of the school year. To successfully produce this rock concert, SCOPE has listed the requisite activities and related information in the following table (duration estimates measured in days) :

Activity	**Immediate Predecessor**	**Optimistic**	**Most Probable**	**Pessimistic**
A	-----	8	10	15
B	-----	7	8	9
C	A	5	6	10
D	B	3	3	3
E	B, C	1	5	9
F	D	4	7	10
G	E	3	8	10

You are required to:

(a) Draw the project network.

(b) Compute the expected duration and variance of each activity.

(c) Determine the critical path in the project network.

(d) What is the expected duration and variance of the critical path?

(e) What is the likelihood that the project will be completed within 30 days?

(f) If activity B is delayed by six days beyond its early start time, how does this affect the expected project duration?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.