Roll No. .....

13000 90/60/30/40

SF-411

February – March 2022

Master of Business Administration (MBA) Examination

(Full Time) (New) First Semester

FT-102C : QUANTITATIVE TECHNIQUES

Time 3 Hours] [Max. Marks 80

Note : Attempt any five questions with a minimum of two questions from each section. All questions carry equal marks.

Section A

1. (a) Explain different types of sets, with examples.

   (b) Elaborate different types of functions with graphs / diagrams and examples.

2. (a) Cost 'C' of manufacturing certain article is given by :

$$C = \left[5 + \frac{48}{x} + 3x^2\right]$$

where 'x' is number of articles produced. Find the minimum value of C. Using derivative concept.

   (b) Demand function of commodity is $p = \left[100 - \frac{x^2}{2}\right]$. If price of commodity is Rs. 10, then find Elasticity of Demand.

3. (a) Evaluate :

$$\int \left[\frac{3x+1}{(x-2)^2\,(x+2)}\right].$$

   (b) If demand function $p = 10 - q - q^2$ and supply function is $p = q + 2$ where 'p' is price and 'q' is quantity demanded in units of certain commodity. Then find (i) Consumer Surplus (ii) Produces Surplus, both at equilibrium price.

4. (a) Solve following equations by inverse of matrix method :

$$\frac{2}{x} + \frac{3}{y} + \frac{10}{z}$$

$$\frac{4}{x} - \frac{6}{y} + \frac{5}{z} = 1$$

$$\frac{6}{x} + \frac{9}{y} - \frac{20}{z} = 2.$$

   (b) From the following Input-Output table : (data in units)

Producer Sector	Consumer Sector		Final Demand	Total Output
	Agriculture	Industry		
Agriculture	300	600	100	1,000
Industry	400	1,200	400	2,000

Calculate gross output so as to meet final demand of '200' units of agriculture and 800 units of industry.

Section B

5. Explain difference between with examples and applications :
   (a) Binomial, Poisson and Normal Distribution
   (b) Decision under Certainty, Uncertainty and Risk
   (c) Correlation and Regression
   (d) Components of Time Series.

6. (a) Calculate Karl Pearson's coefficient of correlation by Karl Pearson's method :

x :	6	2	10	??	8
y :	9	11	??	8	7

If arithmetic mean of x and y be 6 and 8 respectively.

(b) From the following data :

Sales (Rs.)	91	97	108	121	67	124	51	73	111	57
Purchase (Rs.)	71	75	69	97	70	91	39	61	80	47

Find : (i) Two Regression Coefficients (ii) Two Regression Equations (iii) Estimate Sales if Purchase = ('100') (iv) Estimate Purchase if Sales = ('60').

7. Using ratio to moving Average method calculate seasonal indices from following data (of all quarters) https://www.davvonline.com

Year	Quarter I	Quarter II	Quarter III	Quarter IV
2011	68	62	61	63
2012	65	58	56	61
2013	68	63	63	67
2014	70	59	56	62
2015	60	55	51	58

8. A news paper vendor can purchase the news paper @ 2 Rs / copy against selling price of Rs 3 Any unsold copies are however a dead loss Vendor has estimated the following probability distribution for the number of copies demanded

Number of Copies :	15	16	17	18	19	20
Probability % :	4	19	33	26	11	7

Determine how many copies should the vendor buy for maximum gain