Total No. of printed pages = 3

BA 172105

Roll No. of candidate | | | | | | | | | | |

25/3/ **2022**

M.B.A. 1st Semester End-Term Examination

QUANTITATIVE TECHNIQUES IN MANAGEMENT

New Regulation & New Syllabus (w.e.f. 2017-18)

Full Marks – 70 Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer question No. 1 and any *four* from the rest.

1. Fill in the blanks: $(10 \times 1 = 10)$

(i) The probability of drawing an queen from a deck of card is _____

(ii) A matrix is said to be a _____ matrix when the diagonal element are equal to one and all off diagonal elements are zero.

(iii) The variations that repeat within a year is called (seasonal/cyclical) variation.

(iv) Matrix addition or subtraction is not possible when the two matrices are of (same/different) order.

(v) If $y = a.x^n$, then dy/dx is _____

(vi) If $y = C.x$ then dy/dx is _____

(vii) In stratified sampling the entities within a group are (homogeneous/ heterogeneous)

(viii) A contingency table for Chi square has 5 rows and 4 columns. Degrees of freedom will be (20/12)

(ix) Correlation coefficient lies in the range (0 to 1/ –1 to 1)

(x) If $y = 2e^{3x}$, then dy/dx is _____

[Turn over

2. (a) The bag contains five white, six blue and seven green shirts. If three shirts are drawn at random, what is the probability $(3 \times 4 = 12)$

(i) All are white

(ii) All are different colour

(iii) Two are white and one is blue

(iv) None of them are green

(b) Explain Poisson Distribution (3)

3. Find out x, y, z from the following set of equations using inverse of the matrix. Prove that results are same when we follow Cramer's Rule. (10 + 5)

$4x + 5y - z = 35$

$2x + 3y + 2z = 35$

$x + 4y + 2z = 36$

4. (a) From an organisation of 800 employees, a sample of ten percent of the population is to be taken. The researcher wants to use systematic sampling. Explain the sample selection process in detail with the entities that are to be selected. (6)

(b) The data of income of parents and admission of children in government and private school is given. Apply the appropriate test at five percent level of significance to find out whether high income families generally send their children to private schools. (9)

	Number of children	
Income of parents	*Private School*	*Govt. School*
Low	494	506
High	162	438

5. (a) Suppose that the total revenue and total cost function facing a firm is

$TR = 1400Q - 7.5Q^2; TC = Q^3 - 6Q^2 + 140Q + 750$

Find out the

(i) Profit maximising output(q) level

(ii) Maximum profit.

(iii) Profit maximising price (3+3+1)

(b) Find out the AC and MC from the following functions when, Q = 10 & Q = 8.

(i) $TC = 35+5Q-2Q^2+2Q^3$

(ii) $TC = 3Q^2+7Q+12$, where Q is quantity (4 + 4 = 8)

6. (a) Discuss about the 'decision theory" with an example. (5)

(b) Given the following data:

Commodity	Base Year		Current Year	
	Price (in Dollar)	Quantity (in kg)	Price (in Dollar)	Quantity (in kg)
Rice	40	20	65	18
Wheat	80	12	95	10
Sugar	15	5	30	2

(i) Calculate price index number using Fisher's formula.

(ii) Define index number. What are the uses of Index number? Explain

(4+5 = 9)

7. (a) The sales of a company in lacs for seven years is given below. Use the method of least squares to forecast the sales in 2022. (10)

Year	2015	2016	2017	2018	2019	2020	2021
Sales	32	47	65	88	132	190	275

(b) Point out the role of regression analysis in business and industry. (5)
