

BUSINESS MATHEMATICS & STATISTICS

Time : Three Hours

Maximum : 75 Marks

SECTION-A (20 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks (10 x 2 = 20)

- 1 Define and give an example for the following terms (a) Arithmetic progression (b) Geometric progression.
- 2 What is finite set?
- 3 What is meant by dependent variables and independent variables?
- 4 Evaluate $\int x^{-2} dx$.
- 5 Define frequency distribution.
- 6 Define standard deviation.
- 7 State any two properties of correlation.
- 8 Define index numbers.
- 9 Define time series.
- 10 Write any two properties of binomial distribution.

SECTION - B (25 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks (5 x 5 = 25)

- 11 a The first term of a G.P is 4 while its sum to infinity is 5. Find its sum to 8 terms.

OR

- b If $A = \begin{bmatrix} 3 & 5 \\ 2 & a \end{bmatrix}$, $B = \begin{bmatrix} 4 & b \\ 2 & 9 \end{bmatrix}$ and $C = \begin{bmatrix} 26 & a \\ 14 & 45 \end{bmatrix}$ find a and b when $2A + 5B = C$.

- 12 a Evaluate $\int (x - \frac{1}{x})^2 dx$.

OR

- b Find the derivative of $y = x^2 e^x$.
- 13 a State any five differences between diagrams and graphs.
OR
b Calculate the standard deviation and its co-efficient of variation of the following series.
Salary (in '000's) : 75 80 85 90 95 100
No. of persons : 3 7 18 12 6 4

- 14 a Explain scatter diagram.

OR

- b From the following data construct an index for 2015 taking 2014 as base by using unweighted averages of relatives method.

Commodities :	A	B	C	D	E
Price in 2014 (Rs.) :	50	40	80	110	20
Price in 2015 (Rs.) :	70	60	90	120	20

Cont ...

- 15 a Calculate 5 yearly moving averages.

Year :	2010	2011	2012	2013	2014	2015	2016	2017	2018
Production (million tones) :	87	61	92	86	112	101	114	107	121

OR

- b State the properties of normal distribution.

SECTION - C (30 Marks)Answer any **THREE** Questions**ALL** Questions Carry **EQUAL** Marks (3 x 10 = 30)

- 16 By using Cramer's rule solve the following :

$$3x - y + 2z = 8$$

$$x + y + z = 2$$

$$2x + y - z = -1$$

- 17 Integrate
- $\frac{3x}{(x+1)(x+2)}$
- with respect to x.

- 18 Calculate the mean, median and mode.

Marks :	11-20	21-30	31-40	41-50	51-60	61-70	71-80
No. of students :	38	42	120	84	48	36	31

- 19 Calculate the co-efficient of correlation between expenditure on advertisement in Rs. '000 (x) and sales in Rs. lakhs (y).

X :	40	45	47	50	53	60	57	51
Y :	75	69	65	64	70	71	75	83

- 20 Fit a trend line by the method of least squares:

Year :	2011	2012	2013	2014	2015	2016	2017
Profit (Rs. Crores) :	430	473	590	522	382	339	401

Z-Z-Z

END