

2022

(February)

BUSINESS ADMINISTRATION

(Honours)

(Quantitative Analysis)

(BBAC-102)

Marks : 75

Time : 3 hours

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

PART—A

(Marks : 50)

UNIT—1

1. (a) Discuss the nature and scope of statistics. 3+3=6
- (b) The runs scored in a cricket match by 11 players are as follows :
7, 16, 121, 51, 101, 81, 1, 16, 9, 11, 16
Find the mean, mode and median of this data. 4

OR

2. (a) The following are the scores made by two batsmen A and B in a series of innings :

A	:	12	115	6	73	7	19	119	36	84	29
B	:	47	12	76	42	4	51	37	48	13	0

Calculate the standard deviation and coefficient of variation of scores for both the players. Who is better as a run-getter? Who is more consistent player? 2+2+1+1=6

- (b) Define range. Calculate the range from the data given below : 2+2=4
37, 19, 31, 29, 21, 26, 33, 36

UNIT—2

3. (a) What is correlation analysis? 3
- (b) Calculate the correlation coefficient between X and Y from the data given below : 5
- | | | | | | | |
|---|----|----|----|---|---|----|
| X | 2 | 4 | 5 | 6 | 8 | 11 |
| Y | 18 | 12 | 10 | 8 | 7 | 5 |
- (c) If $r = 0.6$ and $n = 64$, calculate the probable error. 2

(3)

OR

4. (a) The following table shows the number of motor registrations in a certain territory for a term of 5 years and the sale of motor tyres by a firm in that territory for the same period :

Year	Motor registrations	No. of tyres sold
1	600	1250
2	630	1100
3	720	1300
4	750	1350
5	800	1500

Find the regression equation to estimate the sale of tyres when the motor registration is known. Estimate the sale of tyres when registration is 850. $4+2=6$

- (b) Discuss any two components of a time series. 4

UNIT—3

5. (a) In a class of 120 students numbered 1 to 120, all even numbered students opt for physics, those whose numbers are divisible by 5 opt for chemistry and those whose numbers are divisible by 7 opt for mathematics. How many opt for none of the three subjects? 5

(4)

- (b) (i) Emily has 4 chairs and she wants to place 3 dolls on these chairs. In how many possible ways can she do this?

- (ii) What are singleton and null sets? $3+2=5$

OR

6. (a) In a class, there are 15 boys and 10 girls. 3 students are selected at random. Calculate the probability that 1 girl and 2 boys are selected. 4

- (b) What are events in probability? Define mutually exclusive and exhaustive events. $2+2+2=6$

UNIT—4

7. (a) If $A = \begin{pmatrix} 3 & 2 \\ 4 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$, find k so that $A^2 = kA + 2I$. 5

- (b) Solve the following by Cramer's rule : 5

$$\begin{array}{rrcr} x & y & z & 6 \\ 2y & 5z & & 4 \\ 2x & 5y & z & 27 \end{array}$$

(5)

OR

8. (a) What are symmetric and skew-symmetric matrices? 2+2=4

(b) If

$$A = \begin{pmatrix} 0 & 1 & 1 \\ 1 & 0 & 1 \\ 1 & 1 & 0 \end{pmatrix}$$

prove that A is skew-symmetric matrix. 6

UNIT—5

9. (a) Evaluate the following : 2+3=5

(i) $\lim_{x \rightarrow 3} \frac{x^2 - 4x + 3}{x^2 - 2x - 3}$

(ii) $\lim_{x \rightarrow 3} \frac{x^2 - 81}{x - 3}$

- (b) What are continuous and discontinuous functions? Give suitable examples. 5

OR

10. (a) If $x = at^2$ and $y = 2at$, find $\frac{d^2y}{dx^2}$. 5

- (b) Find $\frac{dy}{dx}$, when $e^x = y = xy$. 5

(6)

PART—B

(Marks : 25)

UNIT—1

11. Mr. X's monthly income is ₹ 14,400. The monthly expenses of his family on various items are given below :

Item	Rent	Food	Clothing	Education	Savings
Expenditure (in ₹)	4,000	5,400	2,800	1,800	400

Represent the above data by a pie chart. 5

OR

12. Calculate the quartile deviation of the following data : 5

24, 32, 46, 48, 39, 42, 28, 25, 26, 24, 38

UNIT—2

13. Discuss the uses of index numbers in business. 5

OR

14. Explain how trend is estimated in a time series using the moving average method. 5

(7)

UNIT—3

15. (a) If $A = \{1, 2, 3, 4, 5, 6\}$ and $B = \{2, 4, 6, 8\}$,
find $A \cap B$ and $B \cap A$.
- (b) Write the set $A = \{1, 4, 9, 16, 25, \dots\}$ in
set builder form. 3+2=5

OR

16. A bag contains 15 red and 5 blue balls.
Without the replacement of the balls, two
balls are drawn from a bag one after the
other. What is the probability of picking both
the balls as red? 5

UNIT—4

17. What is meant by determinant of a matrix?
Calculate the determinant of

$$A = \begin{vmatrix} 2 & 3 & 1 \\ 6 & 5 & 2 \\ 1 & 4 & 7 \end{vmatrix} \quad 2+3=5$$

OR

18. If

$$A = \begin{vmatrix} 2 & 4 \\ 5 & 1 \end{vmatrix} \text{ and } B = \begin{vmatrix} 3 & 6 \\ 5 & 1 \end{vmatrix}$$

verify that $(AB)^T = B^T A^T$. 5

(8)

UNIT—5

19. (a) When is a function said to be
continuous?
- (b) Find the value of $\lim_{x \rightarrow 3} [x(x-2)]$. 2+3=5

OR

20. (a) What is the derivative of a constant
function?
- (b) Differentiate $20x^3 - 4x^2 - 9x$ with
respect to x . 1+4=5
