

BBA C—102 (Syllabus—2015)

2 0 1 5

(October)

BUSINESS ADMINISTRATION

(Honours)

(**Quantitative Analysis**)

Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

PART—A

(*Marks : 50*)

UNIT—I

1. (a) What is the difference between primary data and secondary data? 4

- (b) The following are the numbers of replacement parts used in a factory in 50 consecutive weeks for a certain group of similar machines :

49 41 45 52 47 46 42 43 46 48

45 36 56 44 61 68 54 58 51 47

47 49 42 48 53 48 41 65 45 52

58 50 55 45 43 72 63 45 38 43

42 47 43 49 46 57 49 44 47 48

Arrange the data in a frequency table and draw the histogram (do not use graph paper). 6

Or

- (a) The following table shows the size of shoes sold at a shop during a given week :

Size of shoes	5	6	7	8	9	10	11
No. of pairs	5	15	30	95	75	25	5

Find the average size sold during that week.

5

- (b) The number of refrigerators sold in six weeks by two branches of a firm is given below :

Week	I	II	III	IV	V	VI
Branch A	4	9	16	10	7	5
Branch B	3	7	15	10	9	4

Calculate the coefficient of variations and state which branch has a more uniform sale.

5

UNIT—II

2. (a) The two regression equations of x and y series are

$$3y = 8x + 30$$

$$10x = 3y + 50$$

Find the coefficient of correlation between x and y .

5

- (b) What is correlation? Name the different types of correlation.

2+3=5

Or

- (a) Calculate the regression equation of y on x from the following data :

5

x	:	1	2	3	4	5
y	:	2	5	3	8	7

- (b) What is meant by 'index numbers'? What are the various uses of index numbers?

2+3=5

UNIT—III

3. (a) If $U = \{2, 4, 6, 8, 10, 12\}$, $A = \{2, 4, 6\}$, $B = \{2, 6, 10\}$ and $C = \{6, 10, 12\}$, then prove that—

(i) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

(ii) $(A \cup B)' = A' \cap B'$

$$2\frac{1}{2} + 2\frac{1}{2} = 5$$

- (b) An urn contains 5 black, 3 white and 7 red balls. A ball is drawn at random. What is the probability that the ball drawn is white or red?

3

- (c) What do you mean by mutually exclusive events?

2

(4)

Or

- (a) How many different permutations can be made out of the letters of the word 'INSTITUTION', taken all together? 3
- (b) In how many ways can 1 chairman and 5 executives sit at a round table if the position of the chairman is fixed? 3
- (c) A candidate is required to answer 5 out of 10 questions which are divided into two groups, each containing 5 questions and he is permitted to attempt not more than 3 from any group. In how many different ways can he make up his choice? 4

UNIT—IV

4. (a) If

$$A = \begin{bmatrix} 7 & 4 & 3 \\ 2 & 5 & 4 \\ 8 & 1 & 1 \end{bmatrix}$$

find the inverse of A. 6

- (b) Given

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

Find AB and BA. 4

(5)

Or

- (a) Define the following : 2+2=4
- (i) Singular matrix
- (ii) Identity matrix
- (b) Solve the following system of equations : 6

$$2x - 3y + z = -1$$

$$3x + y - 2z = 1$$

$$4x - y + z = 9$$

UNIT—V

5. (a) Evaluate : 3+2=5

$$(i) \lim_{x \rightarrow 0} \left\{ \frac{a - \sqrt{a^2 - x^2}}{x^2} \right\}$$

$$(ii) \lim_{x \rightarrow \infty} \left\{ \frac{3x^2 + 2x - 1}{4x^2 + x + 5} \right\}$$

- (b) Find the derivative of the following :

$$2+3=5$$

$$(i) y = (x^2 + 9x)(x^2 - 9x)$$

$$(ii) y = (x + \sqrt{x^2 + 2})^4$$

(6)

Or

- (a) Find the points of maximum and minimum of the function

$$f(x) = x^3 - 2x^2 + x + 9 \quad 5$$

- (b) If the total cost function is given by

$$C = \frac{1}{3}q^3 - 3q^2 + 9q$$

find at what level of output average cost (AC) will be minimum. 5

PART—B

(Marks : 25)

UNIT—I

6. Distinguish between the following : $2\frac{1}{2} + 2\frac{1}{2} = 5$

- (a) Population and Sample
(b) Stratified random sampling and Purposive sampling

Or

Draw 'less than' and 'more than' ogive curves for the following data : $2\frac{1}{2} \times 2 = 5$

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	3	9	15	30	18	5

(7)

UNIT—II

7. Briefly explain the four components of a time series. 5

Or

Distinguish between correlation and regression.

UNIT—III

8. (a) Prove that ${}^nC_r = {}^nC_{n-r}$. 2

- (b) Evaluate ${}^5C_2 \times {}^5P_3 + {}^8C_4$. 3

Or

- (a) State multiplication theorem of probability. 2

- (b) What is the probability of getting two heads in tossing two coins simultaneously? 3

UNIT—IV

9. (a) Is the matrix

$$A = \begin{bmatrix} 2 & -2 & 3 \\ 1 & 0 & -3 \\ 3 & 4 & 0 \end{bmatrix}$$

a singular matrix? Justify your answer. 3

- (b) What is a square matrix? 2

Or

Given

$$A = \begin{bmatrix} 2 & -1 & 4 \\ 1 & 2 & 3 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 0 & 2 \\ 2 & 1 & 3 \end{bmatrix}$$

Find $2A - 3B$.

5

UNIT—V

10. (a) Roughly sketch the graph

$$f(x) = |x|; \quad -1 \leq x \leq 1$$

2

- (b) Find
- $\frac{dy}{dx}$
- for
- $y = \log \left(\frac{x}{x+1} \right)$
- .

3

Or

If the demand function is given by $q = \frac{20}{p+1}$,

find the price elasticity of demand (e_d) at the point, where $p = 3$.

5
