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NBBA 5103

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Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 57103 Roll No.

BBA Examination, 2024-25

(Odd Semester)

QUANTITATIVE ANALYSIS FOR MANAGEMENT

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : $8 \times 1 = 8$

   (a) If $n(A) = 20$, $n(B) = 15$, $n(A \cap B) = 5$, find $n(A \cup B)$.

   (b) Draw the Venn diagram for $(A \cup B)'$.

   (c) Find the median of 64, 18, 2, 9, 49, 27 and 9.

   (d) What is the value of $\sum (x - \bar{x})^2$.

   (e) Write the condition for matrix multiplication.

   (f) Define constraints.

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(g) Find the probability that sum of two dices upper face as 10 in a single roll of two dices.

(h) Write any two properties of regression coefficients.

SECTION – B

2. Attempt any two parts of the following : $2 \times 6 = 12$

(a) Define Venn diagram with the help of Venn diagram shade the following operations :

(i) $A - B$

(ii) $A \cup B$

(iii) $A \cap B$

(iv) A'

(v) $(A \cap B)'$

(vi) ϕ

(b) An average daily wages of 10 workers in a factory A is ₹ 30 and an average daily wages of 20 workers in a factory B is ₹ 15. Find the combined average of daily wages of all the worker of both the factory if two workers left the factory whose wages were ₹ 28 and ₹ 18 respectively.

(c) Prove that the product of two matrices :

$$\begin{bmatrix} \cos^2\theta & \cos\theta & \sin\theta \\ \cos\theta & \sin\theta & \sin^2\theta \end{bmatrix} \text{ and } \begin{bmatrix} \cos^2\phi & \cos\phi & \sin\phi \\ \cos\phi & \sin\phi & \sin^2\phi \end{bmatrix}$$

is zero when θ and ϕ differ by an odd multiply of $\pi/2$.

(d) Define correlation. Describe the types of correlation.

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each questions. 8×5=40

3. (a) Write the definition of the following :

(i) Power set

(ii) Cardinality of a set

(iii) Universal set

(iv) Empty set

(b) Draw a histogram, frequency polygon and frequency curve for the following data :

Class	Frequency
0 – 10	6
10 – 20	12
20 – 30	16
30 – 40	18
40 – 50	8
50 – 60	4

(c) If $A = \{1, 2,3, 4, 5, 6\}$, $B = \{5, 6, 7, 8\}$, $C = \{8, 9, 10\}$ prove that :

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

(ii) $(A \cap B) \cap C = A \cap (B \cap C)$

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

4. (a) Find the quartile deviation and its coefficient from the following distribution :

Weekly Income	58	59	60	61	62	63	64	65	66
No. of Workers	2	3	6	15	10	5	4	3	1

(b) Write the cases and application of mean, median and mode. Also discuss the merits and demerits of each.

(c) Calculate standard deviation :

Age	Frequency
4 – 6	30
6 – 8	90
8 – 10	120
10 – 12	150
12 – 14	80
14 – 16	60
16 – 18	20

5. (a) What is linear programming? Write down its components and applications.

(b) Find A^{-1} if ::

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

(c) Find the value of x xy given that :

$$\begin{bmatrix} x & y \\ 3y & x \end{bmatrix} \begin{bmatrix} 1 \\ 2 \end{bmatrix} = \begin{bmatrix} 3 \\ 5 \end{bmatrix}$$

6. (a) Find the correlation coefficient for :

x	4	8	12	16
y	5	10	15	50

(b) The mean and variance of binomial distribution are 4 and 4/3 respectively. Find p ($x \geq 1$)

(c) Define probability and explain the importance of this concept in statistics.

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