1476/I

B.C.A. (PART-I) EXAMINATION, 2023-24

(I[st] SEMESTER)

1241

Paper : II

(BCA 102: PRINCIPLES OF MATHEMATICS)

Time : Three Hours] [Maximum Marks : 70

Note: (i) Answer **five** questions in all.
(ii) Question No. **1** is **compulsory**.
(iii) Answer remaining **four** questions, selecting **two** from each Section **A** and **B**.
(iv) All questions carry equal marks.
(v) Symbols have their usual meaning.

1. Answer all parts of the following :
   (a) Explain operation on sets.
   (b) What do you mean by Inverse function ?
   (c) Describe the properties of Matrix.
   (d) Define the term Statistics and its uses.

Section-A

2. Describe Matrix with its notation, briefly explain its operations.
   If $A = \begin{bmatrix} 1 & -1 & 2 \\ 3 & 1 & -2 \\ 1 & 0 & 3 \end{bmatrix}$, find its adjoint (A) and Inverse of A.

3. How to find control values? Calculate the control values of the following data :
   7, 3, 7, 5, 13, 20, 23, 39, 23, 40, 23, 14, 12, 56, 23 and 29.
   Calculate standard deviation and variance also.

4. Explain function and its different types. Examine the nature of each of the following function :
   (i) $f: R \to R: f(x) = x^3, \forall\, x \in R$
   (ii) $g: c \to R: g(x) = x^3, \forall\, x \in R$
5. Define equivalence relation and equivalence set with the help of suitable example.

Section-B

6. (a) Why do you calculate standard deviation ?
   (b) The geometric mean of two numbers is 27. One of the number is 89. What will be the other number ?
7. (a) If $A = \begin{bmatrix} 2 & -1 \\ 4 & 3 \\ 7 & 0 \end{bmatrix}$ *and* $B = \begin{bmatrix} -1 & 3 \\ 2 & 9 \end{bmatrix}$ Find a matrix C such that $A.B - C = 0$, does $B.A$ exist ?
   (b) If a relation R is a relation from A to B and S is relation from B to C, them show that $(ROS)^{-1} \neq (R^{-1}OS^{-1})$
8. (a) If $F: R \to R: f(x) = (2x + 1)$ and $g: R \to R:\ g(x) = (x^2 - 2)$ Evolution the following.
   (i) fog
   (ii) gof
   (b) Briefly describe the Domain and Range of a Relation.
9. Attempt any **two** of the following :
   (a) De-Morgan Laws of the set.
   (b) Symmetric Relation.
   (c) Determinant of Matrix.

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