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Total No. of Questions : 07] [Total No. of Pages : 02

Paper ID [BC102]

(Please fill this Paper ID in OMR Sheet)

BCA (Sem. - 1st)

MATHS (Bridge Course) (BC - 102)

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory**.
2) Attempt any **Four** questions from Section - B.

Section - A

Q1) *(10 x 2 = 20)*

a) Define the primary and secondary data.

b) State the Primary rules to be observed in classification of data.

c) Define the minors and co-factors of the determinant.

d) State the properties of matrix addition.

e) Find the value of $(99)^4$, using Binomial theorem.

f) State the principle of mathematical induction.

g) State the Associate Law in set theory.

h) State the De Morgan's Law in set theory.

i) Eliminate θ between $\sin\theta + \cos\theta = x$ and $\sin\theta - \cos\theta = y$.

j) Find the middle terms in

$$\left(\frac{2y^2}{3} + \frac{3}{2y^2}\right)^{10}$$

Section - B

(4 x 10 = 40)

Q2) Calculate the arithmatic mean and median of the frequency distribution in given below. Hence calculate the mode using the emperical relationship between them.

Class-limits	130 - 134	135 - 139	140 - 144	145 - 149	150 - 154	155 - 159	160 - 164
Frequency	5	15	28	24	17	10	1

Q3) Show that

$$\begin{vmatrix} 4 & 5 & 6 & x \\ 5 & 6 & 7 & y \\ 6 & 7 & 8 & z \\ x & y & z & 0 \end{vmatrix} = (x - 2y + z)^2 .$$

Q4) State and prove Binomial theorem for positive integral index.

Q5) Prove by mathematical induction that $n(n + 1)(2n + 1)$ is a multiple of 6 for all $n \in N$.

Q6) In a town of 10,000 families, it was found that 40% families buy newspaper A, 20% families buy newspaper B and 10% families buy newspaper C. 5% families buy A and B, 3% buy B and C and 4% buy A and C. If 2% families buy all the three newspapers, find the number of families which buy (a) A only, (b) B only, (c) None of A, B & C.

Q7) A person standing on the bank of a river observes that the angle subtended by a tree on the opposite bank is 60°. When he retires 100m from the bank, he finds the angle to be 30°. Find the height of the tree and breadth of the river.