Roll No. | | | | | | | | | | | | Total No. of Pages : 02

Total No. of Questions : 07

BCA (2009 to 2010 Batch) (Sem.–4)

MATHEMATICS-II

(Computer Oriented Method)

Subject Code : BC-301

Paper ID : [B0227]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.-**
2. **SECTION-B contains SIX questions carrying TEN marks each and students has to attempt any FOUR questions.**

SECTION-A

1. **Write briefly :**

(a) Find adjoint of $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

(b) If $A = \begin{bmatrix} 1 & -2 \\ 2 & 3 \end{bmatrix}, B = \begin{bmatrix} 3 & -1 \\ 2 & -5 \end{bmatrix}$ prove that (AB)′ = B′A′ where A′ denotes transpose of A.

(c) Find mean of first n natural numbers.

(d) Find median of 2, 4, 7, 4, 9, 3, 4, 2, 3

(e) If $y = x^n . n^x$, find $\frac{dy}{dx}$.

(f) Evaluate $\int x \log x \, dx$

(g) Evaluate $\int \frac{x}{(x-1)(x-2)} dx$

(h) If $y = \log (\log x)$, find $\frac{dy}{dx}$

(i) State Trapezoidal rule for finding value of a definite integral.

(j) Define Skewness and Kurtosis.

SECTION-B

2. Let $A = \begin{bmatrix} 3 & -3 & 4 \\ 2 & -3 & 4 \\ 0 & -1 & 1 \end{bmatrix}$ find A^{-1} and prove that $A^3 = A^{-1}$

3. (a) Solve by Gauss Elimination method

$x + y + z = 3,\ 2x + 3y + z = 6,\ x - y - z = -3$

(b) Calculate the mean deviation from mean for the following data :

Classes	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
f	5	8	7	12	28	20	10	10

4. (a) Calculate S.D. from the following data :

$x \rightarrow$	9	8	7	6	5	4	2
$f \rightarrow$	1	2	1	2	2	1	1

(b) Calculate first four moments of following distribution about mean :

$x \rightarrow$	0	1	2	3	4	5	6	7	8
$f \rightarrow$	1	8	28	50	70	56	28	8	1

5. (a) Differentiate $\sqrt{a+\sqrt{a+\sqrt{a+x^2}}}$ *w.r.t.* x

(b) Find local maximum and local minimum values of $f(x) = x^3 - 27x + 3$.

6. (a) Evaluate $\int (\log x)^2 dx$

(b) Evaluate $\int_{-1}^{1} 5x^4 \sqrt{x^5 + 1}\, dx$

7. (a) Evaluate by Trapezoidal rule $\int_0^2 \frac{dx}{1+x^4}$ taking $n = 4$.

(b) Apply Simpson's $\left(\frac{1}{3}\right)$ rule to evaluate $\int_0^2 \frac{dx}{1+x^4}$ taking n=4. Give answer to 3 places of decimal.