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BCA (Sem. - 4th)
MATHEMATICS - II
(Computer Oriented Methods)
SUBJECT CODE : BC-301 (Batch 2k3 onwards)
Paper ID : [B0227]

[Note: Please fill subject code and paper ID on OMR]

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 × 2 = 20)*

a) Define diagonal matrix with an example.

b) If $A=\begin{bmatrix}3 & 1\\ 4 & 3\end{bmatrix}$ and $B=\begin{bmatrix}1 & 2\\ 2 & 3\end{bmatrix}$ show that $(AB)^T = B^TA^T$.

c) Solve it. $3x + y = 7$, $5x + 3y = 12$

d) Obtain the median:

x :	1	2	3	4	5	6	7	8	9
f :	8	10	11	16	20	25	15	9	6

e) What are the merits of mode?

f) Find $\frac{dy}{dx}$ when $y=\frac{\log x}{x}$.

g) Find $\frac{dy}{dx}$ when $y=\sqrt{x}+x^{-1/3}$.

h) $\int_0^2 \frac{\sin x}{\sin x+\cos x}dx$; Evaluate it.

i) Evaluate $\int \frac{(x-1)^3}{\sqrt{x}}dx$.

j) Write the formula for Trapezoida method.

Section - B

(4 × 10 = 40)

Q2) If $A=\begin{bmatrix}2 & 1\\ 5 & 3\end{bmatrix}$, $B=\begin{bmatrix}4 & 6\\ 3 & 2\end{bmatrix}$; Verify that $(AB)^{-1}=B^{-1}A^{-1}$.

Q3) Use matrix method to solve:

$2x_1 - x_2 + x_3 = 4, \quad x_1 + x_2 + x_3 = 1, \quad x_1 - 3x_2 - 2x_3 = 2$

Q4) Calculate mode and standard deviation.

x :	1-10	11-20	21-30	31-40	41-50	51-60
f :	3	16	26	31	16	8

Q5) Find the maximum and minimum values of the function:

$f(x) = x^3 - 9x^2 + 10x + 5$

Q6) Evaluate:

(a) $\int \frac{e^x(1+x)}{\cos^2(xe^x)}dx$

(b) $\int x\tan x\sec^2 x\,dx$

Q7) Find using Simpson's rule with $h = 0.1$

$\int_0^1 \frac{dx}{1+x^2}$

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