Roll No. ....

Total No. of Questions : 07] _{~~~~~} *allsubjects 4 you . com* [Total No. of Pages : 02

BCA (Sem. - 3ʳᵈ/4ᵗʰ)
MATHEMATICS - II (Computer Oriented)
SUBJECT CODE : BC - 301 (N2)
Paper ID : [B0217]

[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 rank of a matrix.

b) Express following three equations in the form of a single matrix equation.
$a_{11}x + a_{12}y = b_1$, $a_{21}x + a_{22}y = b_2$, $a_{31}x + a_{32}y = b_3$.

c) The frequencies of the numbers 3.2, 5.8, 7.9 and 4.5 are respectively $x, x + 2, x - 3$ and $x + 6$. If arithmetic mean is 4.876, then determine the value of x.

d) The median of the following observations arranged in ascending order is 42. Find x.

22, 24, 33, 37, $x + 1$, $x + 3$, 44, 47, 51, 58.

e) Show that $\int_{0}^{\pi/2} \log \tan x \, dx = 0$.

f) Evaluate $\int_{-\pi/2}^{\pi/2} \cos x \, dx$.

g) Write the method to find maxima of one variable function.

h) Find the fourth derivative of $\log \sqrt{3x+4}$

i) Define Trapezoidal rule.

j) Define Simpson's 3/8 rule.

M-215 [1859]   *P.T.O.*

Section - B

Q2) Solve the equations by matrix inversion method.

$x + y + z = 6$, $x + 2y + 3z = 14$, $x + 4y + 7z = 30$

Q3) For a distribution, the mean is 10, standard deviation is 4, $\sqrt{\beta_1} = 1$ and $\beta_2 = 4$. Obtain the first four moments about the origin i.e. zero.

Q4) If $p^2 = a^2 \cos^2 \theta + b^2 \sin^2 \theta$, prove that $p + \dfrac{d^2 p}{d\theta^2} = \dfrac{a^2 b^2}{p^3}$.

Q5) Evaluate $\displaystyle\int_0^\pi \dfrac{x \tan x}{\sec x + \tan x} dx$.

Q6) Calculate the value of $\displaystyle\int_4^{5.2} \log x \, dx$ by Trapezoidal and simpson's 1/3 rule.

Q7) Find the rank of matrix A.

$$A = \begin{bmatrix} 2 & -1 & 3 & 4 \\ 0 & 3 & 4 & 1 \\ 2 & 3 & 7 & 5 \\ 2 & 5 & 11 & 6 \end{bmatrix}.$$