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

Total No. of Questions : 09

BMCI (2014 & Onwards) (Sem.–2)

MATHEMATICS – II

Subject Code : BMCI-201

Paper ID : [72462]

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION–A

1. Write briefly :

a) Define rank of the matrix

b) Define Median

c) Define Upper Triangular Matrix

d) Define Standard deviation

e) Define singular matrix

f) Differentiate : $\sin x^2$ w.r.t. x.

g) Find the derivative of $\sin 2x \sin 3x$ w.r.t. x.

h) Evaluate : $\int x \sin x \, dx$

i) Find : $\int_0^{\frac{\pi}{2}} \cos^6 x \, dx$

j) Find : $\int_0^{\frac{\pi}{2}} \log \sin x \, dx$.

SECTION–B

2. If $A=\begin{bmatrix} 1 & 3 & 0 \\ -1 & 2 & 1 \\ 0 & 0 & 2 \end{bmatrix}$ and $B=\begin{bmatrix} 2 & 3 & 4 \\ 1 & 2 & 3 \\ -1 & 1 & 2 \end{bmatrix}$. Find AB.

3. Find the inverse of $\begin{bmatrix} -1 & 4 & -6 \\ 8 & 5 & 16 \\ 2 & 8 & 5 \end{bmatrix}$.

4. An aeroplane flies along the four sides of a square at the speed of 100, 200, 300 and 400 km/hr respectively. What is the average speed of plane in its flight around the square?

5. Find the second derivative w.r.t. x *if* $x = a\ (t + \sin t)$, $y = a\ (1 + \cos t)$.

6. Integrate : $\int e^x x^2\, dx$.

SECTION–C

7. Solve: $5x + 2y + 5z = 23$, $4x + 4y + 2z = 19$, $3x + 2y + 4z = 18$ by Crammer rule.

8. A particle moves along the curve $6y = x^2 + 2$. Find the points on the curve at which the y-co-ordinate changes 8 times faster than x-co-ordinate.

9. Calculate the mean and standard deviation of following :

Size	6	7	8	9	10	11	12
Frequency	3	6	9	13	8	5	4

NOTE : Disclosure of identity by writing mobile number or making passing request on any page of Answer sheet will lead to UMC case against the Student.