

Roll No. 

Total No. of Pages : 02

Total No. of Questions : 09

BMCI (2014 &amp; Onwards) (Sem.-2)

**MATHEMATICS – II**

Subject Code : BMCI-201

M.Code : 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)  $2x + 3y = \begin{bmatrix} 2 & 3 \\ 4 & 0 \end{bmatrix}$  and  $3x + 2y = \begin{bmatrix} 2 & -2 \\ -1 & 5 \end{bmatrix}$ , find  $x$  and  $y$ .

b) If  $A = \begin{bmatrix} 5 & -1 \\ 6 & 7 \end{bmatrix}$   $B = \begin{bmatrix} 2 & 1 \\ 3 & 4 \end{bmatrix}$ , show  $AB \neq BA$ .

c) Find M.D from median 3, 9, 5, 3, 12, 10, 8, 4, 7, 19, 21.

d) The Mean of numbers  $a, b, 8, 5, 10$  is 6 and variance 6.8. Find value of  $a$  and  $b$ .

e) Differentiate  $y = \frac{x+1}{x-1}$ .

f) Differentiate  $y = x^2 \cos x$ .

g) Integrate  $\int x \tan x \, dx$ .

h) Write the difference between simple interest and compound interest.

i) Define annuity.

j) Write co-factor of matrix  $\begin{bmatrix} 2 & 1 & 3 \\ 4 & -1 & 0 \\ -7 & 2 & 1 \end{bmatrix}$ .

**SECTION-B**

2. Find inverse of matrix  $A = \begin{bmatrix} 2 & 1 & 3 \\ 4 & -1 & 0 \\ -7 & 2 & 1 \end{bmatrix}$

3. Find standard deviation

$x$	0-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45
$f$	20	24	32	28	20	16	34	10	16

4. Differentiate  $(x + 1)^3 (x + 2)^2 (2x - 7)^4$

5. Integrate  $\int \frac{dx}{9x^2 + 6x + 5}$

6. Find two positive number  $x$  and  $y$  such that  $x + y = 60$  and  $xy^3$  is maximum.

**SECTION-C**

7. a) Solve following system of linear equations using omen rule

$$2x + 3y + 3z = 5$$

$$x - 2y + z = -4$$

$$3x - y - 2z = 3$$

b) Evaluate  $\int_0^6 \frac{dx}{1+x^2}$  using simpson  $\frac{1}{3}$  rule

8. Using concept of co-efficient of variation state which group is more variable A or B.

<b>X</b>	10-20	20-30	30-40	40-50	50-60	60-70	70-80
<b>Group A</b>	9	17	32	33	40	10	9
<b>Group B</b>	10	20	30	25	43	15	7

9. a) Differentiate  $y = \frac{e^x + \sin x}{1 + \log x}$

b) Calculate amount and compound interest on Rs. 3500 at 10% per annum in 2 years.

**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.**