

Roll No.

Total No. of Pages : 02

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BBA (2014 to 2017)/BRDM/B.SIM (2014 & onwards) (Sem. 2)

## BUSINESS MATHEMATICS

Subject Code : BBA-203

M.Code : 10546

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 consists of FOUR Sub-sections : Units-I, II, III & IV.
3. Each Sub-section contains TWO questions each, carrying TEN marks each.
4. Students have to attempt any ONE question from each Sub-section.

### SECTION-A

1. a) If  $\log 2 = 0.3010$ , find  $\log 64$ .  
b) Prove that  $\log_a m = \log_a m \times \log_a b$ .  
c) Define Diagonal and transpose of matrix.

d) Find cofactor of 3 in  $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 3 & 6 \\ 3 & 2 & 0 \end{bmatrix}$

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

f) Find second order derivative of  $x^2 \cdot 2 \cdot \sqrt{x}$ .

g) Expand  $(2x + 3y)^5$

h) Find general term in the expansion of  $(2x + \frac{1}{x})^5$ .

i) Define derivative

j) Evaluate  $\begin{bmatrix} 1 & 3 & 5 & 1 \\ 4 & 6 & 0 & 3 \\ 8 & 2 & 3 & 0 \end{bmatrix}$

## SECTION-B

### UNIT-I

2. The value of the machine depreciates at the rate of 7% p.a. If present value of machine is Rs. 70,250, find the value after  $4\frac{3}{4}$  years.
3. Suppose that 100 of the 120 Mathematics students at a college take at least one of the languages French, German and Russian. Also suppose 65 study French, 45 German, 42 study Russian, 20 study French and German, 25 study French and Russian, 15 study German and Russian.
  - a) Find the number of students studying all the subjects.
  - b) Find the number of students studying exactly one subject.

### UNIT-II

4. Using Cramer's rule, solve  $x + 2y = 10$ ,  $2x - y - z = 8$ ,  $-2y + z = 7$ .

5. Find inverse of  $\begin{bmatrix} 1 & 2 & 0 \\ 2 & 1 & 2 \\ 0 & 1 & 1 \end{bmatrix}$ .

### UNIT-III

6. An open box with square base is to be made of a given quantity of a card board area  $c^2$ . Show that maximum volume of the box is  $\frac{c^3}{6\sqrt{3}}$ .
7. Differentiate  $(\sin x)\cos x$ .

### UNIT-IV

8. a) Find 9th term in expansion of  $\left(x + \frac{3a}{x}\right)^{12}$ .  
 b) The second, third and fourth terms in the expansion of  $(x + y)^n$  are 240, 720 and 1080 respectively. Find the values of  $x$ ,  $y$  and  $n$ .
9. a) Find the coefficient of  $x^4$ , in the expansion of  $(1 - 3x)^2 \cdot \frac{1}{1 - 2x}$ .  
 b) If the coefficient of three successive terms in the expansion of  $(1 + x)^n$  are the ratio of  $1 : 3 : 5$ , then find the value of  $n$ .

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.