Roll No. | | | | | | | | | | | | Total No. of Pages : 03

Total No. of Questions : 18

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. Two finite sets have m and n elements. The total number of subsets of the first set is 56 more than the total number of subsets of the second set. Find the values of m and n.

2. State De-Morgan's Law.

3. In a class of 25 students, 12 have taken economics, 8 have taken economics but not politics. Find the number of students who have taken economics & politics and those who have taken politics but not economics.

4. Show by means of an example that the product of two non-zero matrices can be a zero matrix.

5. Let $A = \begin{pmatrix} 1 & 0 & 2 \\ 0 & 2 & 3 \\ 0 & 0 & 5 \end{pmatrix}$ then show that $|3A| = 27|A|$.

6. Without expanding prove $\begin{vmatrix} 9 & 9 & 12 \\ 1 & -3 & -4 \\ 1 & 9 & 12 \end{vmatrix} = 0$.

7. Use logarithms to solve the following equation : $3^x = 2$.

8. Given $y = (4x + 3)^{-5}$, find $\frac{dy}{dx}$.

9. Differentiate $\sin^2 x^3$ w.r.t. x.

10. Find the 3rd term of $\left(3x - \frac{y^3}{6}\right)^4$

SECTION-B

UNIT-I

11. a) State and prove inclusion-exclusion principle.

    b) If A, B, C be any three sets, then prove that

    $(A \cup B) \times C = (A \times C) \cup (B \times C)$.

12. In a town of 10,000 families, it was found that 40% families buy newspaper A, 20% families buy newspaper B and 10% newspaper C, 5% buy A and B, 3% buy B and C and 4% buy A and C. If 2% families buy all the three newspapers, find the number of families which buy

    a) A only b) B only c) only C d) none of A, B and C.

UNIT-II

13. If $A = \begin{pmatrix} 2 & -1 & 1 \\ -1 & 2 & -1 \\ 1 & -1 & 2 \end{pmatrix}$ and $B = \begin{pmatrix} 3 & 1 & -1 \\ 1 & 3 & 1 \\ -1 & 1 & 3 \end{pmatrix}$, find the product AB and use this result to solve the following system of linear equations :

    $2x - y + z = -1$; $-x + 2y - z = 4$: $x - y + 2z = -3$.

14. Using properties of determinants, prove that :

$$\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix} = (a + b + c)(ab + bc + ca - a^2 - b^2 - c^2).$$

UNIT-III

15. Show that of all rectangles with a given perimeter, the square has the largest area.

16. Differentiate the following function w.r.t. x :

    a) $\tan^{-1} x^4$

    b) $\log \log \log x^3$.

UNIT-IV

17. The coefficients of $(r-1)^{th}$, r^{th} and $(r+1)^{th}$ terms in the expansion of $(x+1)^n$ are in the ratio 1 : 3 : 5. Find both n and r.

18. a) State and prove Logarithmic Base changing formula.

    b) The value of machine when new is Rs. 20,000. It depreciates in its value at the rate of 3% per annum in the first 4 years and then at the rate of 5% per annum in the next six years. What will be its value after 10 years?

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.