

Roll No.

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Total No. of Pages : 03

Total No. of Questions : 09

BBA (2012 & Onwards)
BRDM / Bachelor In Service Industry Management (SIM) (2014 Batch)
(Sem.-2)

BUSINESS MATHEMATICS

Subject Code : BBA-203

Paper ID : [C0242]

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
- 2. SECTIONS-B consists of FOUR Sub-sections : Units-I, II, III & IV.**
- 3. Each Sub-section contains TWO questions each, carrying TEN marks each.**
- 4. Student has to attempt any ONE question from each Sub-section.**

SECTION-A

1. Write briefly :

- Define Set.
- What do you mean by Adjoint of the Matrices?
- Define Minors.
- Differentiate $y = x^2$ from first principles.
- Define Rank of a determinant.
- What will be the number of subsets of a set containing n elements?
- Define Binomial Theorem.
- The first and tenth term of a G.P. are 3 and 65 respectively. Find the common ratio.
- Define power set.
- Determine $\log_x 2401$ when $x^3 = 7$.

SECTION-B

UNIT-I

2. a) Let A, B, C be any three sets. Prove that $A \cap (B - C) = (A \cap B) - (A \cap C)$.
- b) A factory inspector examined the three types of defects in an item *i.e.* hardness, finish and dimensions. After examining 100 items he gave the following report :

All three defects, 5; defects in hardness and finish, 10; defects in dimension and finish, 8; defects in dimension and hardness, 20; Defects in finish, 30; in hardness, 23; in dimension, 50. The inspector was fined. Why?

3. In a survey conducted of women it was found that
- i) there are more single than married women in locality A.
 - ii) there are more married women who own cars than unmarried women.
 - iii) there are fewer single women who own cars and homes than married women without cars and without homes.

Is the number of single women who own cars and do not own homes greater than number of married women who do not own cars but own homes?

UNIT-II

4. Solve with the help of determinants :

$$5x - 6y + 4z = 15$$

$$7x + 4y - 3z = 19$$

$$2x + y + 6z = 46$$

5. Verify the distributive law $A(B + C) = AB + AC$ and $(A + B)C = AC + BC$ for the matrices,

$$A = \begin{bmatrix} 1 & 1 & 1 \\ 2 & 2 & 2 \\ 3 & 3 & 3 \\ 0 & 0 & 0 \end{bmatrix}$$

$$B = \begin{pmatrix} 1 & 0 & -1 \\ 0 & -1 & 1 \\ -1 & 1 & 0 \end{pmatrix},$$

$$C = \begin{pmatrix} -1 & -1 \\ 2 & 2 \\ 1 & 1 \end{pmatrix}.$$

UNIT-III

6. a) Differentiate $y = x^2(x + 1)(x^3 + 3x + 1)$ with respect to x
- b) If $x^m y^n = (x + y)^{m+n}$, prove that $\frac{dy}{dx} = \frac{y}{x}$.
7. a) The sum of two numbers is 24. Find the numbers if the sum of their squares is to be minimum.
- b) Find $\frac{dy}{dx}$ and $\left(\frac{dy}{dx}\right)_{x=3}$ for $y = x^3$.

UNIT-IV

8. If $p = q$ nearly and $n > 1$, show that $\frac{(n+1)p + (n-1)q}{(n-1)p + (n+1)q} = \left(\frac{p}{q}\right)^{\frac{1}{n}}$.
9. Prove that $\log x = \log [1 - \{1 - (1 - x^2)^{-1}\}^{-1}] - 1/2$.