

**Anjuman Islam Janjira Degree College of Science**  
**Murud-Janjira, Raigad-402401**  
**Affiliated to University of Mumbai**

<b>Class: -F.Y.BMS</b>	<b>Subject: - Business Mathematics</b>
<b>Semester:- II</b>	<b>Course code:</b>
<b>Exam Event:- Summer 2024 (FH)</b>	<b>Marks: -75</b>
<b>Date: - 18/04/2024</b>	<b>Duration: - 2 Hours and 30 Minutes</b>

**Q1 A. Choose the correct alternative from the following and rewrite the sentence (Attempt any 8) 08**

1. The simple interest on 4500 for 2 years at 6% p.a is  
a) 504                                      b) 540                                      c) 5400                                      d) 1800
2. The future value of an amount is always \_\_\_\_\_ Its present value.  
a) Greater than                      b) Less than                                      c) Equal to                                      d) None of these
3. Given principal 1500, Number of years 3, Interest 225. Then the rate of the simple interest will be.  
a) 3                                      b) 4                                      c) 5                                      d) 6
4. A column matrix is of order \_\_\_\_\_.  
a) 1xn                                      b) nx1                                      c) nxn                                      d) mxn
5. A row matrix is of order \_\_\_\_\_.  
a) 1xn                                      b) nx1                                      c) nxn                                      d) mxn
6. Derivative of function y with respect to x is \_\_\_\_\_.  
a) Remainder                                      b) Stock broker                                      c) Rate of Change                                      d) None of these
7. Second order derivative is \_\_\_\_\_.  
a) Derivative square                                      b) Derivative Cube                                      c) Derivative                                      d) None of these
8. The derivative of a constant is \_\_\_\_\_.  
a) Zero                                      b) One                                      c) Infinity                                      d) None of these
9. Values between tabular points is called \_\_\_\_\_.  
a) Interpolation                                      b) Extrapolation                                      c) Midterpolation                                      d) Variable annuity
10. The interval between the data in interpolation is denoted by \_\_\_\_\_.  
a) h                                      b) x                                      c) k                                      d) j

**QI B. State whether the statements are True or False. (Attempt any 7) 07**

1. Simple interest is always less than compound interest.
2. The S.I. of 3 years at 9% p.a of 5000 is 1300.
3. Present value of an amount is also known as discounted value.
4. Using Cramer's rule, we can solve simultaneous equation.
5. Value of Determinant and its transpose are same.
6.  $dy/dx$  is the rate of change of x with respect to y.
7. For a constant function y, the value of  $dy/dx$  is one
8. If the total cost is known the cost of producing one extra unit is called average cost.
9. For  $y= 4x+12$ , the first order differences are constant.
10. Newton formulated the interpolation formula.

**QII) A.** A sum of rupees 500 was lent at 6% per annum and rupees 600 at 7% p.a. simple interest. At what time would the total interest be Rs. 144. **07**

**B.** Ketan borrows Rs. 2000 from Sachin at compound interest of 10% p.a. to be calculated on quarterly basis. What amount is due to him after 9 months. Also state his interest. **08**

**or**

**P.** Mr. Kishore plans to save for his son's education for a sum of Rs. 100000 at the end of 4 years. How much should he invest at the end of each year from now. **07**

**Q.** A person borrowed Rs 10000 at 12 percent p.a. If he is supposed to return the money within 2 years find his EMI using Reducing Balance Method **08**

**QIII) A.** If  $A = \begin{bmatrix} 2 & 1 \\ -1 & 3 \end{bmatrix}$   $B = \begin{bmatrix} -3 & 2 \\ 4 & 1 \end{bmatrix}$   $C = \begin{bmatrix} 5 & -2 \\ 1 & 3 \end{bmatrix}$  verify this  $A + B = B + A$  **07**

**B.** If  $A = \begin{bmatrix} 2 & -1 \\ 4 & 3 \end{bmatrix}$   $B = \begin{bmatrix} 3 & -2 \\ -1 & 4 \end{bmatrix}$  find a matrix  $X$  such that  $2A + X = 3B$  **08**

**or**

**P.** Find  $AB$  and  $BA$  where  $A = \begin{bmatrix} 5 & 2 \\ -3 & 7 \end{bmatrix}$   $B = \begin{bmatrix} 1 & -3 & 4 \\ 5 & 8 & -2 \end{bmatrix}$  **07**

**Q.** Solve the following equations by using Cramers Rule.  
 $2x - y + 3z - 4 = 0$ ,  $x + y + z - 2 = 0$ ,  $3x + y - z - 2 = 0$  **08**

**QIV) A.** Find  $dy/dx$  for

1)  $x^4 + x^3 - 2x^2 + 5x + 9$

2)  $(2x - 5)^2$  **08**

**B.** Find  $dy/dx$  for  $y = (x-2)(x-3)^2$  **07**

**or**

**P.** If marginal revenue is 20 and elasticity of demand with respect to price is 2. Find the price. **07**

**Q.** Divide 100 into two parts such that the sum of their square is minimum. **08**

**QV) A.** Write down all the minors and cofactors related to the matrix  $\begin{bmatrix} 1 & 2 & 4 \\ 0 & -1 & 2 \\ 3 & 0 & 1 \end{bmatrix}$  **07**

**B.** Find the equation of a polynomial passing through Newtons Backward Interpolation Formula for the following data: (0,3), (1,5), (2,9), (3,15) **08**

**or**

**Write Short Notes (Any 3)** **15**

1. Types of Annuity
2. Input Output Analysis
3. Matrix and its Laws
4. Elasticity of Demand
5. Relation between Marginal Revenue and  $x$ .