

Business Mathematics

Model Examination Paper

Section A (Multiple Choice Questions)

(20 Marks)

1. Choose the best answer for the following.

i. Number system depends on two basic concepts.

Binary and decimal Digits and position Binary and digits Binary and position

ii. The value of x in the following.

$$\frac{101+x}{11} = 110$$

1001 1011 1101 1010

iii. If $\begin{bmatrix} 2x & 4 \\ 6 & 2 \end{bmatrix}$ is a singular matrix, then x is equal to:

2 4 6 12

iv. The product of a matrix and its multiplicative inverse is a/an:

Identity Matrix Singular Matrix Non Singular Matrix Diagonal Matrix

v. The order of matrix A is 4 x 5 and order of matrix B is 5 x 3, then order of (AB)^t is:

4 x 3 4 x 5 5 x 4 3 x 4

vi. The y-intercept of the parabolic curve $y = 3x^2 + 2x - 7$ is:

7 -7 0 1/7

vii. If the number of rows and columns are equal, then matrix is called:

Singular Matrix Square Matrix Rectangular Matrix Null Matrix

viii. If $\begin{bmatrix} x+y & 7 \\ 2 & y \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 2 & 3 \end{bmatrix}$ then x and y are:

2 & 3 3 & 2 2 & 5 5 & 3

ix. (AB)⁻¹ is equal to:

A⁻¹ x B⁻¹ B⁻¹ x A⁻¹ (BA)⁻¹ None of these

x. $2^{2x+5} = 64$

2 1/2 3/2 2/3

xi. The effective rate of interest on 16% compounded quarterly is:

16.90% 16.98% 16.99% 16.96%

xii. If $f(x) = 7x - 5$ then the value of $f(x + 3)$ is:

7x - 2 7x + 16 7x - 16 7x + 2

xiii. If x and y intercepts of the line are 3/2 and 5/4 respectively then the equation of the line is:

$10x + 12y = 15$

$12x + 10y = 15$

$10x - 12y = 15$

$12x - 10y = 15$

xiv. **The ratio between 3 days and 40 hours is:**

5 : 9 4 : 9 9 : 5 5 : 4

xv. **The time in which Rs. 65000 would be earned on Rs. 50000 at 20% per annum is:**

5.6 years 6.5 years 1.5 years 4.5 years

xvi. **The point $(-6/5, -5/6)$ would lie in:**

1st Quadrant 2nd Quadrant 3rd Quadrant 4th Quadrant

xvii. **The direction of the parabolic curve $7x^2 + 2x - 15 = 0$ is:**

Upward Downward Left Right

xviii. **When the principal remains same for the entire period, the interest is:**

Simple interest Compound interest None of these

xix. **$X^0 = ?$**

0 1 2 3

xx. **The highest degree of the linear equation is:**

0 1 2 3

SECTION B

(Short-Answer Questions)

Attempt any eight of the following.

(40 Marks)

2.

- i. If $y = -x(x + 5) + 6$ then find vertex and roots.
- ii. Find $11101 \times 110 - 10101 \times 101$
- iii. Find the effective rate of interest if the nominal rate of interest is 8.4% compounded quarterly.
- iv. If a straight line passing through two points $(-2, 3)$ and $(4, 5)$ then find the equation of the line and the distance between points.
- v. Find $x:y$ if $25x^2 - 60xy + 36y^2 = 0$
- vi. If $A = \begin{bmatrix} 2 & -1 \\ 3 & 5 \end{bmatrix}$ then verify that $A^{-1}A = I$
- vii. Mr. Babar invests Rs. 150000 in a scheme for 8 years @ 6.5% compounded semi-annually. Find how much he gain at the end of 8 years.
- viii. Solve the following equations.

$$\sqrt{3x+1} - 2 = 2x - 8$$

- ix. 30 workers complete a work in 50 days work 10 hours a day. Find in how many days 25 workers complete this work, working 12 hours a day.

x. If $\begin{vmatrix} x & 2 & x+2 \\ 1 & -1 & 1 \\ 2 & 1 & 3 \end{vmatrix} = 5$ then find the value of x .

SECTION C

(Detailed-Answer Questions)

Attempt any four of the following.

(40 Marks)

3. (a) Solve the following equations by using Cramer's Rule.

$$x - 2y = 11$$

$$7x - 4y = 27$$

- (b) Mr. Babar sold an item for Rs. 6954 at a loss of 8.5%. Find the selling price of the item if he sold at 20% profit on sale.

4. (a) Mr. Irshad deposit Rs. 9500 at the end of each month for 5 years @ 9% compounded monthly. Find the sum of annuity and present value.

- (b) Solve

$$\frac{3x-1}{x+3} + \frac{3x+2}{x+1} = 3$$

5. Solve the following equations by using inverse matrix method.

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

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

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

6. (a) Distribute Rs. 150000 among A, B and C in the ratio 2 : 3 : 5.

- (b) If $a : b = 4 : 5$, $b : c = 3 : 4$ and $c : d = 6 : 7$ then find $a : b : c : d$.

7. If $A = \begin{bmatrix} 2 & 7 \\ 4 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 6 \\ 8 & 7 \end{bmatrix}$ then find the following.

- (a) $A^t \times B$ (b) $3B^t + 4A^t$ (c) $(A - B)^t$