

OSHWAL EDUCATION TRUST MANAGED
SMT. CZMG BCA COLLEGE
BCA – SEM – 2 – PRELIMINARY EXAM MARCH – 2022

SUBJECT: MATHS

MARKS - 70

Q.1-A Answer the following questions in brief

4

1. Define determinant
2. How many elements in 3 X 3 determinant.
3. "The value of a determinant is unchanged if its corresponding rows and columns are interchange" - True or False.
4. Expand $\begin{vmatrix} a1 & a2 \\ b1 & b2 \end{vmatrix}$

Q.1-B Attempt anyone from following two questions

2

1. If $A = \begin{vmatrix} 3 & k \\ 6 & 7 \end{vmatrix} = 3$ then find the value of k.
2. If $A = \begin{vmatrix} 1 & 1 & 3 \\ 3 & 3 & 1 \\ 2 & 2 & 6 \end{vmatrix}$ then find the value of A.

3

Q.1-C Attempt any one from following two questions

1. Solve: $3x + y = 1, 3x - y = 2$ by Cramer's rule.
2. If $x = \begin{bmatrix} 6 & -4 \\ -2 & 3 \end{bmatrix}$, find (Adj x).

Q.1-D Attempt any one from following two questions

5

1. Explain any two property of determinant.
2. Solve: $2x + 3y + z = 9, x + 2y + 3z = 8, 3x + y + 2z = 7$ by Cramer's rule.

Q.2-A Answer the following questions in brief

4

1. Define diagonal matrix.
2. Define inverse of matrix.
3. Define null matrix.
4. Define square matrix.

2

Q.2-B Attempt any one from following two questions

1. If $A = \begin{bmatrix} 4 & 1 & 3 \\ 2 & 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 1 & 2 \\ 2 & 1 & 2 \end{bmatrix}$ then find $3A - 2B$
2. If $A = \begin{bmatrix} 4 & 1 & 3 \\ 2 & 2 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 2 & 2 \\ 1 & 1 \\ 2 & 2 \end{bmatrix}$ then find $A \cdot B$

Q.2-C Attempt any one from following two questions

3

1. Define identity and triangle matrix.
2. If $A = \begin{bmatrix} 1 & 0 \\ 1 & 2 \end{bmatrix}$ and $I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ then prove that $A^2 = 3A - 2I$.

Q.2-D Attempt any one from following two questions

5

1. If $A^2 = \begin{bmatrix} 5 & 4 \\ 4 & 5 \end{bmatrix}$ then find A.
2. Solve $x + y + z = 5, 2x - 3y - 4z = -11, 3x + 2y - z = 6$ using matrix method

Q.3-A Answer the following questions

4

1. The distance between two points (4, 5) and (1, 1) IS _____
2. Define Equal set.
3. Find the midpoint of line segment joining points A(3,1) and B(5,3).
4. Define Finite set.

Q.3-B Attempt any one from following two questions

2

1. If $A = \{x, y\}$ and $B = \{-1, -2\}$ then find $A \times B$.
2. Define intersection of two sets.

Q.3-C Attempt any one from following two questions

3

1. Find the Area of triangle for (2, 1), (-3, 1) and (0, -3)
2. Show that (2, -2), (8, 4), (5, 7) and (-1, 1) are the vertices of rectangle.

Q.3-D Answer anyone from following two questions

5

1. Explain De'Morgan laws with logical proof.
2. Show that (-3, -2), (7, 4) and (1, 14) are the vertices of an isosceles right angled triangle.

Q. 4-A Answer the following questions in brief:

4

1. Find mean for the data 25, 35, 63, 22, 54, 23, 45.
2. Define Range.
3. Define Mode.
4. Define Mean.

Q. 4-B Answer anyone from following two questions

2

1. Define quartiles.
2. For the data 2, 3, 7, 10, 5, 7, 14, 7, 8, 9, find Mode.

Q. 4-C Answer anyone from following two questions

3

1. For moderately skewed frequency distribution, $\bar{x} + M = 155$ and $\bar{x} - M = 15$ then find the value of Z
2. Calculate mean(assumed mean) and mode for following data:

x	100	200	300	400	500	600	700
f	9	12	16	20	21	15	10

Q.4-D Answer anyone from following two questions

5

1. Find mean, median and mode for following data.

x	0-10	10-20	20-30	30-40	40-50	50-60	60-70
f	5	7	8	11	9	4	3

2. If the median for following data is 46. Find the missing frequency if total frequency is 400.

x	10 – 20	20 – 30	30 – 40	40 – 50	50 - 60	60 - 70	70 – 80
f	12	30	F1	65	F2	25	18

Q. 5-A Answer the following questions in brief :

4

1. Define Geometric progression.
2. Define Sequence.
3. Write down the formula of nth terms of an arithmetic progression,
4. Write down the formula of nth terms of a geometric progression.

Q. 5-B Answer anyone from following two questions.

2

1. Find the sum of 100, 90, 80, 70,... up to 18th terms
2. Find Sum of 1, 2, 4, 8 up to 12th Terms

Q. 5-C Answer anyone from following two questions.

3

1. The 4th term of an AP is 19 and its 12th term is 51, find its 21st term
2. If the third term of A.P. is 12, sixth term is 42, and then finds 26th term

Q. 5-D Answer anyone from the following two questions.

5

- (1) Find the sum of all natural numbers between 200 and 400 which are divisible by 7.
- (2) The sum of $0.2+0.22+0.222+0.2222+\dots$