B.K. BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
A CBSE DAY–CUM–BOYS' RESIDENTIAL SCHOOL

PERIODIC TEST-1 2025-26
APPLIED MATHEMATICS

Class: XII B	**Time: 1hr**
Date: 03.07.25	**Max Marks: 25**
Admission no:	**Roll no:**

General Instructions:

1. This Question Paper has 4 Sections A, B, C and D.
2. Section A has 5 MCQs carrying 1 mark each
 3. Section B has 2 questions carrying 02 marks each.
4. Section C has 2 questions carrying 03 marks each.
5. Section D has 2 questions carrying 05 marks each.
6. All Questions are compulsory.

SECTION A

1. If for matrix A, $A^3 = I$, then $A^{-1} =$ 1m
   (a) A   (b) A^2 (c) A^3 (d) None of these

2. If A, B are two non-singular matrices of same order, then   1m
   (a) AB is non singular   (b) AB is singular   (c) $(AB)^{-1} = B^{-1}A^{-1}$ (d) None of these

3. For what value of K inverse does not exist for the matrix $\begin{bmatrix} 1 & 2 \\ k & 6 \end{bmatrix}$?   1m
   (a) 0   (b) 3   (c) 6   (d) None of these

4. If A and B are square matrices of same order, then AB' – BA' is a   1m
   (a) skew-symmetric matrix   (b) symmetric matrix   (c) null matrix   (d) None of these

5. If A is any m x n matrix and B is a matrix such that AB and BA are both defined, then B is matrix of order   1m
   (a) n x m   (b) m x m   (c) m x n   (d) None of these

SECTION B

6. If A = $\begin{bmatrix} 3 & -5 \\ -4 & 2 \end{bmatrix}$, show that $A^2 - 5A - 14\,I = 0$ 2m

7. If A = $\begin{bmatrix} 1 & 0 & 1 \\ 0 & 1 & 2 \\ 0 & 0 & 4 \end{bmatrix}$, then show that $|3A| = 27|A|$.   2m

SECTION C

8. Cost of a pen and a note book are Rs. 12 and Rs. 27 respectively. On A given day shopkeeper P sells five pens and seven notebooks whereas another shopkeeper Q sells 6 pens and four note books find the money received by both the booksellers using matrix algebra.   **3m**

9. Find the values of k if the area of the triangle with vertices (-2, 0), (0, 4) and (0, k) is 4 square units.   **3m**

SECTION D

10. Solve the following system of linear equations by Cramer's rule: **5m**
$6x + y -3z-5=0$
$x + 3y -2z-5=0$
$2x+y+4z-8=0$

11. Express the following as the sum of symmetric matrix and a skew symmetric matrix and verify your result.   **5m**

$$\begin{bmatrix} 3 & -2 & -4 \\ 3 & -2 & -5 \\ -1 & 1 & 2 \end{bmatrix}$$

***********BEST OF LUCK***********