



B.K. BIRLA CENTRE FOR EDUCATION

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



PRE MID TERM 2026-27 APPLIED MATHEMATICS (241)

Class: XII
Date: 22/07/25
Admission no:

Time: 1hr
Max Marks: 25
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. The degree of differential equation $\frac{d^2y}{dx^2} = \left[1 + \left(\frac{d^2y}{dx^2}\right)^2\right]^{3/2}$.
a) 1 b) 2 c) 3 d) None of these
2. The number of solutions of $\frac{dy}{dx} = \frac{y+1}{x-1}$ when $y(1) = 2$ is:
a) One b) two c) Infinite d) none
3. $(48 \times 39) \bmod 5$ is equal to:
a) 2 b) 1 c) 5 d) 4
4. The units place digit of 2^{100} is:
a) 4 b) 5 c) 6 d) 7
5. Pipe A can fill a tank 20 minutes and pipe B can fill it in 30 minutes. If both the pipes are opened together, then the time taken to fill the tank is:
a) 10 minutes b) 12 minutes c) 15 minutes d) 18 minutes

SECTION B

6. Form the differential equation corresponding to $y^2 = a(b^2 - x^2)$ by eliminating a and b .
7. Find the last digit (unit digit) of 22^{12} .

SECTION C

8. Solve the differential equation: $(x+2)\frac{dy}{dx} = x^2 + 4x - 9$.
9. A man goes 12 km downstream and comes back to starting point by swimming nonstop in 3 hrs. If the speed of stream is 3km/hr, find the speed with which the man can swim in still water.

SECTION D

10. A tank is filled in 5 hours by three pipes A, B and C. Pipe C is twice as fast as B and pipe B is twice as fast as pipe A. How much time will pipe A alone take to fill the tank?
11. Find the differential equation of the family of curve $c(y+c)^2 = x^3$.

***** All The Best *****