

Model Question Paper
Differential Equations - Part III

12th Standard

Maths

Reg.No. :

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I. Answer all questions.

II. Use blue pen only.

Time : 01:00:00 Hrs

Total Marks : 100

5 x 1 = 5

Section-A

- 1) The complementary function of $(D^2 + 1)y = e^{2x}$ is
(a) $(Ax + B)e^x$ (b) $A \cos x + B \sin x$ (c) $(Ax + B)e^{2x}$ (d) $(Ax + B)e^{-x}$
- 2) A particular integral of $(D^2 - 4D + 4)y = e^{2x}$ is
(a) $\frac{x^2}{2}e^{2x}$ (b) xe^{2x} (c) xe^{-2x} (d) $\frac{x}{2}e^{-2x}$
- 3) The differential equation of the family of lines $y = mx$ is
(a) $\frac{dy}{dx} = m$ (b) $y dx - x dy = 0$ (c) $\frac{d^2y}{dx^2} = 0$ (d) $y dx + x dy = 0$
- 4) The degree of the differential equation $\sqrt{1 + \left(\frac{dy}{dx}\right)^{1/3}} = \frac{d^2y}{dx^2}$
(a) 1 (b) 2 (c) 3 (d) 6
- 5) The degree of the differential equation $c = \frac{\left[1 + \left(\frac{dy}{dx}\right)^3\right]^{2/3}}{\frac{d^3y}{dx^3}}$ where c is a constant is
(a) 1 (b) 3 (c) -2 (d) 2

Section-B

4 x 3 = 12

- 6) Form the differential equations by eliminating arbitrary constants given in brackets $y = e^{3x}(C \cos 2x + D \sin 2x)$ $\{C, D\}$
- 7) Form the differential equation from the following equation.
 $y = e^{2x}(A + Bx)$
- 8) Form the differential equation from the following equation.
 $y = e^x(A \cos 3x + B \sin 3x)$
- 9) Form the differential equation from the following equation.
 $y^2 = 4a(x - a)$

Section-C

5 x 6 = 30

- 10) Solve the following: $\frac{dy}{dx} + y = x$
- 11) Solve: $(D^2 - 13D + 12)y = e^{-2x}$
- 12) Solve the following: $yx^2 dx + e^{-x} dy = 0$
- 13) a) Solve the following: $(x^2 + 5x + 7)dy + \sqrt{9 + 8y - y^2} dx = 0$

(OR)

- b) Solve the following: $\frac{dy}{dx} = \sin(x + y)$

Section-D

2 x 10 = 20

- 14) Solve $\frac{dy}{dx} = e^{3x+y}$
- 15) Solve $(x^2 - ay) dx = (ax - y^2) dy$
