Model Question Paper

Differential Equations - Part III

12th Standard

Business Maths

Reg.No. : | | | | | | |

I.Answer all the questions.

II.Use blue pen only.

Time : 01:30:00 Hrs

Total Marks : 85

Part-A

5 x 1 = 5

1) The complementary function of the differential equation $(D^2 - D)y = e^x$ is

(a) $A + Be^x$ (b) $(Ax + B)e^x$ (c) $A + Be^{-x}$ (d) $(A + Bx)e^{-x}$

2) The complementary function of the differential equation $(D^2 - 2D + 1)y = e^{2x}$ is

(a) $Ae^x + Be^{-x}$ (b) $A + Be^x$ (c) $(Ax + B)e^x$ (d) $A + Be^{-x}$

3) The particular integral of the differential equation $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = e^{5x}$ is

(a) $\frac{e^{5x}}{6}$ (b) $\frac{xe^{5x}}{2!}$ (c) $6e^{5x}$ (d) $\frac{e^{5x}}{25}$

4) The particular integral of the differential equation $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 9y = e^{3x}$ is

(a) $\frac{e^{3x}}{2!}$ (b) $\frac{x^2e^{3x}}{2!}$ (c) $\frac{xe^{3x}}{2!}$ (d) $9e^{3x}$

5) The solution of $\frac{d^2y}{dx^2} - y = 0$ is

(a) $(A + B)e^x$ (b) $(Ax + B)e^{-x}$ (c) $Ae^x + \frac{B}{e^x}$ (d) $(A + Bx)e^{-x}$

Part-B

5 x 6 = 30

6) Solve : $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$

7) Solve : $\frac{dy}{dx} = \frac{y+2}{x-1}$

8) Solve : $(1 - e^x)sec^2y dy + 3e^x tan\ y\ dx = 0$

9) Solve : $\frac{dy}{dx} = 2xy + 2ax$

10) Solve : $x(y^2 + 1)dx + y(x^2 + 1)dy = 0$

Part-C

5 x 10 = 50

11) The total cost of production y and the level of output x are related to the marginal cost of production by the equation $(6x^2 + 2y^2)\ dx - (x^2 + 4xy)\ dy = 0$. What is the relation between total cost and output if y = 2 when x = 1?

12) solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 4y = 5 + 3e^{-x}$

13) solve $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} + 4y = 2e^{-3x}$

14) Solve $(16D^2 - 24D + 9)\ y = 0$

15) solve $3\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 2y = 0$

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