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Code No. 7035 / E / R

FACULTY OF SCIENCE

B.Sc. II-Semester (CBCS) Examination, June 2018

Subject: Mathematics

Paper – II
Differential Equations

Time: 3 Hours **Max.Marks: 80**

PART – A (5x1 = 20 Marks)
[Short Answer Type]

Note: Answer any FIVE of the following questions.

1 Solve: $x\,dx + y\,dy = \frac{x\,dx - y\,dy}{x^2 + y^2}$.

2 Solve: $\frac{dx}{x^2 - y^2 - z^2} = \frac{dy}{2xy} = \frac{dz}{2xz}$.

3 Find the particular integral of $\left(D^3 + 3D^2 + 2D\right)y = x^2$.

4 Solve: $(D^4 - 1)\,y = \sin x$

5 Find A, B, C and D if $y = 4x^2 + Bx + C + Dxe^{2x}$ is particular integral integral of $(D^2 - 3D + 2)\,y = 2x^2 + 3e^{2x}$ by method of undetermined coefficients.

6 Solve: $(y+z)p + (x+z)q = x+y$.

7 Solve: $p(1+q) = qz$.

8 Solve: $(2x+3)^2 \frac{d^2y}{dx^2} - 2(2x+3)\frac{dy}{dx} - 12y = 6x$.

PART – B (4x15 = 60 Marks)
[Essay Answer Type]

Note: Answer ALL the questions.

9 a) Solve: $p^2 + 2py \cot x = y^2$.

OR

b) Solve: $(xy^2 - x^2)dx + (3x^2y^2 + x^2y - 2x^3 + y^2)\,dy = 0$.

10 a) Solve: $(D^2+1)y = x^2 \sin 2x$.

OR

b) Solve: $(D^2 - 2D + 1)\,y = xe^x \sin x$.

11 a) Explain method of variation of parameters of solving $a_2y'' + a_1y' + a_0y = Q(x)$, $(a_2 \neq 0)$.

OR

b) Solve $(D^2 + 4D + 4)y = 3x\,e^{-2x}$ by method of undetermined coefficients.

12 a) Solve: $\frac{\partial u}{\partial x} = 2\frac{\partial u}{\partial t} + u, u(x,0) = 6e^{-3x}$ by variable separable method.

OR

b) Solve: $(x^2 - yz)p + (y^2 - 2x)q = z^2 - xy$.

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