Code No. 7035 / E

FACULTY OF SCIENCE

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

Subject: Mathematics

Paper – II
Differential Equations

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

PART – A (5x4 = 20 Marks)
[Short Answer Type]

Note: Answer any FIVE of the following questions.

1 Solve: $(1+e^{x/y})dx + e^{x/y}(1-x/y)dy = 0$.

2 Solve: $\frac{dx}{x^2} = \frac{dy}{y^2} = \frac{dz}{n\,xy}$

3 Solve: $y'' - 3y' + 2y = 0$ with $y = 0$ and $y' = 0$ when $x=0$.

4 Find the particular integral of $(D^3 - D^2 - 6D)\,y = x^2+1$.

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

6 Solve: $x^2\frac{d^2y}{dx^2} + x\frac{dy}{dx} - 4y = x^2$.

7 Solve: $\frac{\partial z}{\partial x} + \frac{\partial z}{\partial y} = \frac{z}{a}$, a is constant.

8 Form a partial differential equation by eliminating constants h and k from $(x-h)^2 + (y-k)^2 = c^2$.

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

Note: Answer ALL the questions.

9 a) Solve: $y + px = x^4p^2$.

OR

b) Solve: $(y^2 + yz)dx + (z^2+zx)dy + (y^2-xy)\,dz = 0$

10 a) Solve: $(D^2 - 4D - 12)\,y = (x-1)e^{2x}$.

OR

b) Solve: $(D^2 - 2D + 5)y = e^{2x}\sin x$.

..2

11 a) Solve $(D^2 - 3D + 2)y = \text{Sin } e^{-x}$ by method of variation of parameters.

OR

b) Solve $(D^2 + 3D + 2)y = 12e^x$ by method of undetermined coefficients.

12 a) Solve: $(mz - ny)\,p + (nx - \ell z)q = \ell y - mx$.

OR

b) Solve:

i) $\sqrt{p} + \sqrt{q} = 1$

ii) $p^2 + q^2 = m^2$.

****