

Date: 23/02/2017

Test No: 1

Branch: FE (All)

Subject: Applied Mathematics-II

Marks: 20

Semester: II

(02 Marks each)

10 Marks

Q. 1) Attempt any five

a) Which of the following equations is an exact DE?

- A. $(x^2 + 1) dx - xy dy = 0$ B. $x dy + (3x - 2y) dx = 0$ C. $2xy dx + (2 + x^2) dy = 0$ D. $x^2y dy - y dx = 0$

b) Solve the differential equation $(x + y) dy = (x - y) dx$

- A. $x^2 + y^2 = c$ B. $x^2 + 2xy + y^2 = c$
C. $x^2 - 2xy - y^2 = c$ D. $x^2 - 2xy + y^2 = c$

c) Solve $(\cos x \cos y - \cot x) dx - \sin x \sin y dy = 0$

- A. $\sin x \cos y = \ln(c \cos x)$ B. $\sin x \cos y = \ln(c \sin x)$ C. $\sin x \cos y = -\ln(c \sin x)$ D. $\sin x \cos y = -\ln(c \cos x)$

d) Find the general solution of $\frac{dy}{dx} = y \sec x$

- A. $y = C(\sec x + \tan x)$ B. $y = C(\sec x - \tan x)$ C. $y = C(\sec x \tan x)$ D. $y = C(\sec^2 x + \tan x)$

e) Solve the linear equation: $\frac{dy}{dx} + \frac{y}{x} = x^2$

- A. $xy^2 = \frac{x^3}{4} + C$ B. $xy = \frac{x^4}{3} + C$ C. $xy = \frac{x^4}{4} + C$ D. $y = \frac{x^3}{4} + C$

f) Solution of the differential equation $(x^2 + y^2 + 1) dx - 2xy dy = 0$ is

- A. $x^2 + y^2 + 1 = cx$ B. $x^2 + y^2 - 1 = cx$ C. $x^2 - y^2 - 1 = cx$ D. $x^2 - y^2 + 1 = cx$

Q. 2) a) Solve the following differential equation.

5 Marks

$$(xy^2 - e^{1/x^3}) dx - x^2y dy = 0.$$

OR

b) Solve the following differential equation

5 Marks

$$\left[\log(x^2 + y^2) + \frac{2x^2}{x^2 + y^2} \right] dx + \left(\frac{2xy}{x^2 + y^2} \right) dy = 0$$

Q. 3) a) Solve the following differential equation

$$(1 + x + xy^2) dy + (y + y^3) dx = 0$$

5 Marks

b) Solve the following differential equation

OR

$$\frac{dy}{dx} + x(x + y) = x^3(x + y)^3 - 1$$

5 Marks