Half Yearly Examination-2020-21

B.C.A. Part-III

PAPER SECOND: DIFFERENTIAL EQUATIONS AND FOURIES SERIES

[Time- 3 hours] [Maximum Marks : 50]

Note: Attempt any two parts from each question, All questions carry equal marks.

1.(a) Solve: $\frac{dy}{dx} = ex^{-y} + x^2e^{-y} + xe^{-y}$

(b) Solve: y = 3x + alogp

(c) Solve: $P^2 - 2p\cosh x + 1 = 0$

2.(a) Find the orthogonal trajectories of the family curves:

$$ax^2 + y^2 = 1$$

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

(c) Solve: : $x^2\frac{d^2y}{dx^2} + 7x\frac{dy}{dx} + 13y = \log x$

3.(a) Solve: $x^2p + y^2q = z^2$

(b) Solve: $(2D^{2}\,{}^{-}\,5DD + 2D'^2)$

(c) find the complete integral of $(x + y)(p + q)^2 + (x - y)(p - q)^2 = 1$.

4.(a) Obtain Fourier series of the function $(x + x^2)$ in the interval $-\pi < x < \pi$

(b) Find Fourier series of the function f(x) = x sinx in the interval and $(-\pi,\pi)$ deduct that

$$\frac{\pi}{4} = \frac{1}{2} + \frac{1}{1-3} - \frac{1}{3.5} + \frac{1}{5.7}$$

(c) Obtain the Fourier series of the function f(x) = x sinx the interval $0 < x < 2\pi$

5.(a) What is convergence μ of Fourier series ?

(b) Define Gibbs phenomenon.

(c) Write applications of fourier series of differential equation with examples.

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