Mid Sem - II - 2019

Mathematics - II All Branches (except CSE)

Max Marks - 20 Answer any five Time - 1.30 hr

Q. 1. Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + 4y = e^x \cos x$

2. Solve $\frac{d^2y}{dx^2} - 5\frac{dy}{dx} + 6y = x \sin 3x$

3. Solve $\frac{d^2y}{dx^2} - 2\frac{dy}{dx} + y = x e^x \sin x$

4. Solve $\frac{d^2y}{dx^2} + a^2y = \tan ax$ by variation of parameters.

5. Solve $x^2\frac{d^2y}{dx^2} - x\frac{dy}{dx} + 4y = x \sin(\log x)$

6. Find the series solution of the equation $\frac{d^2y}{dx^2} + x\frac{dy}{dx} + x^2y = 0$ about $x = 0$

7. Prove that $(2n-1)x P_{n-1} = nP_n + (n-1)P_{n-2}$, $n \geq 2$

8. Prove (i) $J_{1/2}(x) = \sqrt{\frac{2}{\pi x}} \sin x$ (ii) $J_{-1/2}(x) = \sqrt{\frac{2}{\pi x}} \cos x$

9. Find the analytic function $f(z) = u + iv$ where $u = e^x(x \cos y - y \sin y)$

10.

$= 0 = 0 =$