Dr. Pradeep Pandey

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

T2 EXAMINATIONS, OCTOBER-2019

B.Tech III Semester (BL)

Course Code: 10B11MA201   MAX. MARKS: 25

Course Name: Mathematics-II   MAX. TIME: 1.5 Hours

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Each question carry equal marks.

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

2. Solve the Cauchy Euler equation $x^2y'' - 2xy' + 2y = 2x^3$ using standard method.

3. Using variation of parameters method, solve $x^2y'' - 2xy' + 2y = 4x^3$.

4. Using Rodrigues' formula, obtain $P_0(x)$, $P_1(x)$, $P_2(x)$, $P_3(x)$ and hence express the polynomial $10x^3 + 3x^2 - 3x + 1$ in terms of the Legendre's polynomials.

5. Using separation of variables find the solution of one dimensional wave equation $c^2u_{xx} = u_{tt}$ subject to boundary conditions $u(0,t) = 0$, $u(L,t) = 0$ and the initial conditions $u(x,0) = f(x)$, $u_t(x,0) = g(x)$.

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