JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-2 APRIL -2019

B.Tech. Semester II (CSE/IT/ECE/CE)

COURSE CODE:18B11MA211/10B11MA201   **MAX. MARKS:** 25

COURSE NAME: Engineering Mathematics-II/Mathematics-II

COURSE CREDITS: 04   **MAX. TIME:** 1.5 HRS

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

---

1. Find the Fourier Cosine series (Half Range Expansion) of the function

$$f(x) = x, \ 0 < x < L.$$ [CO-1]

2. Find the complete solution of the differential equation

$$y'' - 3y' + 2y = xe^{3x}.$$ [CO-2]

3. Solve the differential equation using the method of variation of parameters :

$$y'' - 6y' + 9y = \frac{e^{3x}}{x^2}.$$ [CO-2]

4. Find the power series solution of the differential equation about the origin

$$(1 - x^2)y'' - xy' + 4y = 0.$$ [CO-3]

5. For the Bessel's function $J_n(x)$, show that   [CO-3]

$$J_{\frac{5}{2}}(x) = \sqrt{\frac{2}{\pi x}} \left[\left(\frac{3-x^2}{x^2} \right) sinx - \frac{3}{x} cosx \right]$$