Dr Neelnath

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

(Summer Semester-Mid Term) - June-2018

COURSE CODE: 11B11MA201 MAX. MARKS: 50

COURSE NAME: Mathematics II

COURSE CREDITS: 04 MAX. TIME: 2 Hrs

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

Q1.Discuss the convergence of $\frac{x}{1+x}+\frac{x^2}{1+x^2}+\frac{x^3}{1+x^3}+\cdots$ [8]

Q2.Find the power series solution of $4xy''+2y'+y=0$ *about* $x=0$ [12]

Q3. Express $J_{5/2}$ and $J_{-5/2}$ in terms of sine and cosine. [8]

Q4.For Legendre polynomial $P_n(x)$

show that $nP_n(x)=(2n-1)xP_{n-1}(x)+(n-1)P_{n-2}(x)$ [8]

Q5.Express x^3+2x^2+x-3 in terms of Legendre polynomial. [4]

Q6.For Chebyshev polynomial $T_n(x)$ show that $T_{n+1}(x)-2xT_n(x)+T_{n-1}(x)=0$ [5]

Q7.Express $5x^3+3x+2$ in terms of Chebyshev polynomial. [5]