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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3, EXAMINATION- MAY-2019

B.Tech. II Semester (BI/BT)

COURSE CODE: 18B11MA212/ 10B11MA212 (Backlog) MAX. MARKS: 35

COURSE NAME: BASIC MATHEMATICS-II

COURSE CREDITS: 04 MAX. TIME: 2:00 Hrs.

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

Quest 1 Test the convergence of the series **[4] [CO-1]**

$$\frac{x^2}{2\sqrt{1}}+\frac{x^3}{3\sqrt{2}}+\frac{x^4}{4\sqrt{3}}+\cdots\cdots$$

Quest (2) Expand $f(x,y)=2x^2-xy+y^2+3x-4y+1$ in Taylor's series of maximum order about the point $(-1,1)$. **[3] [CO-2]**

Quest (3) (a) Find the order and degree of the following differential equation **[1+3] [CO-3]**

$$\left[1+\left(\frac{dy}{dx}\right)^2\right]^{\frac{3}{2}}=\left(\frac{d^3y}{dx^3}\right)^4$$

(b) Solve $x\frac{dy}{dx}+y\log y=xy\,e^x$

Quest (4) Solve **[5] [CO-4]**

$$x^2\frac{d^2y}{dx^2}-2x\frac{dy}{dx}+4y=x^4-\frac{1}{x^2}$$

Quest (5) Estimate the value of $y(22)$ and $y(42)$ from the following data **[5] [CO-6]**

x	20	25	30	35	40	45
$y(x)$	354	332	291	260	231	204

Quest (6) (a) Using Newton- Raphson method, find the real root (between 0 and 1) of the equation $\cos x=2x$, correct up to 4 decimal places. **[2+2] [CO-6]**

(b) Using Trapezoidal rule and taking $h=0.2$, evaluate

$$\int_0^2 e^{x^2}\,dx$$

Quest (7) Calculate the median and mode of the following data **[5] [CO-5]**

Class	0 - 7	7 -14	14 - 21	21 - 28	28 - 35	35 - 42	42 - 49
Frequency	19	25	36	72	51	43	28

Quest (8) Calculate the mean and standard deviation (by using Step-Deviation method) for the following frequency distribution - **[5] [CO-5]**

Class	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Frequency	5	10	20	40	30	20	10	5