

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

T-1, EXAMINATION- February-2019

B.Tech. II Semester (BI/BT)

COURSE CODE: 18B11MA212/ 10B11MA212 (Backlog)

MAX. MARKS: 15

COURSE NAME: BASIC MATHEMATICS-II

COURSE CREDITS: 04

MAX. TIME: 1:00 Hrs.

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

Quest (1) Examine the convergence of the series

[CO-1] [3]

$$\sum_{n=1}^{\infty} \frac{(n+1)(n+2)}{n^2 \sqrt{n}}$$

Quest (2) Test the following series for absolute convergence and conditional convergence.

$$\sum_{n=1}^{\infty} \frac{(-1)^{n+1}}{\sqrt{n^2+n}}$$

[CO-1] [3]

Quest (3) If $z = e^{ax+by} f(ax-by)$, then prove that

[CO-2] [3]

$$b \frac{\partial z}{\partial x} + a \frac{\partial z}{\partial y} = 2abz$$

Quest (4) If $u = \sin^{-1} \left(\frac{x^2 y^2}{x+y} \right)$, prove that

[CO-2] [3]

$$x \frac{\partial u}{\partial x} + y \frac{\partial u}{\partial y} = 3 \tan u.$$

Quest (5) Using Taylor's Theorem, expand $f(x, y) = \sin x \sin y$ about the point $(0, 0)$, upto terms of third degree.

[CO-2] [3]