

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST -1 EXAMINATION- 2024  
B.Tech-I Semester (BI/BT)

COURSE CODE(CREDITS): 18B11MA212  
COURSE NAME: Basic Mathematics-II  
COURSE INSTRUCTORS: MDS

MAX. MARKS: 15

MAX. TIME: 1 Hour

*Note: (a) All questions are compulsory.*

*(b) Marks are indicated against each question in square brackets.*

*(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

Q1. Write the nth term of the sequence  $\langle S_n \rangle_{n \in \mathbb{N}}$  and also test it for the convergence, where [2] (CO-1)

$$\langle S_n \rangle = \left\{ \frac{3^2}{1 \cdot 2}, \frac{5^2}{3 \cdot 4}, \frac{7^2}{5 \cdot 6}, \dots \right\}$$

Q2. Examine the convergence of the series [4] (CO-1)

$$\sum_{n=1}^{\infty} \left( \frac{n}{(n-1)(n+3)} \right) x^n$$

Q3. Discuss the convergence of the series [3] (CO-1)

$$\sum_{n=1}^{\infty} \frac{(3n-2)(3n)}{(3n+2)^2(3n+5)^2}$$

Q4 Test the following series for absolute or conditionally convergence [3] (CO-1)

$$\frac{1}{1 \cdot 2^2} - \frac{1}{2 \cdot 3^2} + \frac{1}{3 \cdot 4^2} - \frac{1}{4 \cdot 5^2} + \dots$$

Q5. Find  $\frac{\partial f}{\partial x}$  and  $\frac{\partial f}{\partial y}$  if [3] (CO-2)

$$f(x, y) = \frac{2y}{y + \cos x}$$