JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

B.Tech-V Semester (M&C)

COURSE CODE (CREDITS): 24BS1MA312 (4) MAX. MARKS: 15

COURSE NAME: Real Analysis and Differential Equations

COURSE INSTRUCTOR: P K Pandey MAX. TIME: 1 Hour

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

(b) The candidate is allowed to make suitable numeric assumptions wherever required for solving problems.

(c) Use of calculator is not allowed.

Q.No	Question	CO	Marks
Q1	Prove or disprove that $(3\mathbb{Z}, +)$ is a commutative group.	1	3
Q2	Define a countable set and classify each of the following sets as countable or uncountable (also give reasons). (i) $\mathbb{Q} \cap [0,1]$ (ii) $[0,1] - \left\{\frac{1}{n} : n \in \mathbb{Z}^+\right\}$	1	3
Q3	Verify all properties of a field for $\mathbb{Q}$ with respect usual addition and usual multiplication.	1	3
Q4	Define a Cauchy sequence, and prove that every Cauchy sequence of real numbers is bounded. Give an example showing that the converse is false.	1	3
Q5	Define monotonic sequences, and show that the sequence (x_n), where $x_n = \frac{1}{n+1} + \frac{1}{n+2} + \cdots + \frac{1}{n+n}$, $n \in \mathbb{Z}^+$ is convergent.	1	3

JUIT TEST - 1 EXAMINATION - AUG 2026

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