

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

B.Tech-I Semester (CSE/IT/ECE/CE/BT/BI)

COURSE CODE (CREDITS): 25B11CI511 (3)

MAX. MARKS: 15

COURSE NAME: Deep Learning

COURSE INSTRUCTORS: Dr. Kushal Kanwar

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

| Q.No | Question  | CO | Marks |
|------|---|----|-------|
| Q1   | Show that neural networks are functionally complete.  | 1  | 3     |
| Q2   | Prove that without non-linearity, n layers are just equal to one layer in neural networks.  | 1  | 3     |
| Q3.  | Explain the statement "Neural Networks are Turing-complete".  | 2  | 2     |
| Q4.  | <p>Label the weights in the network below. Write algebraic equations for <math>y_i</math>'s and <math>z</math>, taking weights into account. If <math>[x_1, x_2, x_3]=[1,2,3]</math> and <math>b=1</math>, and all weights are 0.5, calculate <math>y_i</math>'s and <math>z</math>.</p> <div style="text-align: center;"> <p>Input Layer                  Hidden Layer(s)                  Output Layer</p> </div> | 2  | 3     |
| Q5   | Write equations for Adam, explain momentum and adaptive learning rate in these equations, along with the parameters and their roles.  | 3  | 4     |