

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

~~Jan - Feb~~ 2026

B. Tech Program / Electronics and Telecommunication Engineering - Scheme IIB

Supplement Examination 1st Y Semester VII

Course Code: EXDLC7041 Course Name: Neural Network and Deep Learning

Date of Exam: **31/01/2026**

Duration: **02.5 Hours**

Max. Marks: 60

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams wherever applicable.
- (3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	Explain a single-layer recurrent neural network with a diagram	5	1	U
b)	Discuss why deep learning needs non-linearity.	5	2	U
c)	Explain the steps, Plots, Formulas, advantages, and disadvantages of the Adam optimization technique	5	3	U
Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	What is greedy layer-wise training in a neural network?	5	4	U
b)	Explain the ReLu function	5	5	U
c)	What is an average pooling layer?	5	6	U
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	Implement McCulloch & Pitts neurons for the AND function 1. Draw the Neural Network 2. Write the truth table 3. Write the equation ■ Y target is 1, then $w \geq \theta$ ■ If the target is 0, then $w < \theta$ 4. Solve the equations and find the weights.	10	1	U, A
b)	What are hyperparameters? List the hyperparameters of deep. Explain the impact of any three hyperparameters on the deep neural network.	10	3	U

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c)	Explain the ResNet50 and its architecture, including the necessary specifications and diagrammatic representations	10	5	U
Q.4	Solve any two questions out of three. (10 marks each)	20		
a)	Find the weights required to perform the following classification using a perceptron network. The vectors (1 1 1 1) & (-1 1 -1 -1) belong to class 1, and (1 1 1 -1) & (1 -1 -1 1) belong to class -1. Assume $\alpha = 1$ and initial weights are '0'. After 3 epochs, find the final weights.	10	2	U, A
b)	What is optimization? List and compare different types of optimizers.	10	4	U
c)	Explain LSTM and its architecture	10	6	U
