R22 Regulation *Subject code: 4E8FA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech VIII Semester Regular Examinations, May 2026

Deep Learning

(IT)

Maximum Marks: 60 Date:04.05.2026 Duration: 3 hours

Note: **1. This question paper contains two parts A and B.**
2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BTL
1.a)	Define overfitting.	1	1	L1
b)	What is Maximum Likelihood Estimation (MLE)?	1	1	L1
c)	Define early stopping.	1	2	L1
d)	What is a sparse representation?	1	2	L1
e)	Identify the role of a kernel/filter in CNN.	1	3	L1
f)	State the purpose of padding in convolution.	1	3	L1
g)	Define echo state network.	1	4	L1
h)	What is vanishing gradient problem?	1	4	L1
i)	State the concept of large-scale deep learning.	1	5	L1
j)	Explain the role of deep learning in computer vision.	1	5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BTL
2	Describe supervised and unsupervised learning algorithms with examples.	10	1	L2
	OR			
3a	Discuss hyperparameters and validation sets in model selection.	5	1	L2
3b.	Explain XOR problem and its solution using neural networks.	5		L1
4a	Explain L1 and L2 regularization techniques in deep learning.	5	2	L1
4b	Apply dropout technique in a neural network and explain its effect on training.	5		L3
	OR			
5	Analyze the key optimization challenges in neural networks and their impact on model performance.	10	2	L4
6	Explain the convolution operation in CNN with mathematical formulation and a suitable example.	10	3	L2
	OR			
7	Illustrate how CNNs are applied to different data types like images, audio, and text with suitable examples.	10	3	L4

8	With architectural diagram explain encoder-decoder function.	10	4	L2
	OR			
9	Assess the effectiveness of various optimization techniques in handling long-term dependencies in deep networks.	10	4	L3
10	What are the steps involved in multi-digit number recognition using deep learning.	10	5	L3
	OR			
11	Discuss and evaluate the impact of deep learning in various application domains.	10	5	L4