R22 Regulation *Subject code: 4E7EA*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VII Semester Supplementary Examinations, May 2026

DEEP LEARNING

(CSE)

Maximum Marks: 60 Date:05.05.2026 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)	How do you compute gradients in a neural network?	1M	1	I
b)	What is the purpose of the backpropagation algorithm?	1M	1	I
c)	Why is batch normalization useful during training?	1M	2	I
d)	How do initialization methods depend on the activation function used?	1M	2	I
e)	What is pooling in CNNs, and why is it used?	1M	3	I
f)	Compare the computational complexity of standard vs depthwise separable convolution.	1M	3	II
g)	What are the challenges in training deep RNNs?	1M	4	I
h)	What is a leaky unit in an RNN?	1M	4	I
i)	Define **specificity** and **sensitivity** in the context of binary classification.	1M	5	V
j)	How does the spectrogram represent audio data?	1M	5	I

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a) What challenges in feature extraction motivated deep learning? b) Why is Stochastic Gradient Descent preferred over batch gradient descent for large datasets?	5M 5M	1	I I
	OR			
3	a) What metrics are used to evaluate a classification model? b) Define supervised and unsupervised learning with examples.	5M 5M	1	I I
4	a) Why is L1 constraint diamond-shaped and L2 constraint circular? b) What is the difference between synthetic data generation and augmentation?	5M 5M	2	I I
	OR			
5	a) How do these techniques exploit the manifold hypothesis in deep learning? b) What is an adaptive learning rate? Why is it useful?	5M 5M	2	I I

6	a) Explain the architecture of CNN.. b) How does pooling contribute to translation invariance?	5M 5M	3	II I
	OR			
7	a) What is the difference between circular, causal, and valid convolutions? b) Why is convolution preferred over fully connected layers for image processing?	5M 5M	3	I I
8	a) What are the main advantages of RNNs over feedforward networks? b) What is the difference between deterministic and stochastic decoding?	5M 5M	4	I I
	OR			
9	a) Compare deep RNNs and deep feedforward networks. b) What kinds of data structures are best modeled by RecNNs?	5M 5M	4	II I
10	a) What is the role of feature maps in CNNs? b) What are applications of deep learning in finance?	5M 5M	5	I I
	OR			
11	a) What is the role of attention in NLP models? b) What is the difference between sequence labeling and text classification?	5M 5M	5	I I