



R22 Regulation

Subject code:4E6GB

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech VI Semester Supplementary Examinations, November 2025

DEEP LEARNING

(CSE(AI&ML))

Maximum Marks: 60

Date:11.11.2025

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	Bloom Tx
1.a)	Differentiate between supervised and unsupervised learning	1M	CO1	L4
b)	What is the function of a hidden unit in a neural network?	1M	CO1	L1
c)	What is dropout and how does it help in regularization?	1M	CO2	L1
d)	List two challenges in neural network optimization.	1M	CO2	L1
e)	Define pooling.	1M	CO3	L3
f)	Define the concept of unsupervised features in CNNs.	1M	CO3	L2
g)	List the key difference between a unidirectional and a bidirectional Recurrent Neural Network (RNN)	1M	CO4	L2
h)	Define Long Short-Term Memory (LSTM).	1M	CO4	L1
i)	Define the concept of hyper parameter selection.	1M	CO5	L2
j)	What is a default baseline models?	1M	CO5	L1

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	Describe stochastic gradient descent (SGD). How does it differ from batch gradient descent? Discuss its advantages.	10M	CO1	L2
OR				
3	Illustrate the architecture and working of a deep feedforward neural network using XOR as an example.	10M	CO1	L2
4	Analyze the role of noise robustness and semi-supervised learning in improving model performance when labeled data is limited.	10M	CO2	L4
OR				
5	Compare basic optimization algorithms with those using adaptive learning rates (e.g., Adam, RMSprop). How do they affect convergence?	10M	CO2	L5
6	Discuss the motivation behind using convolutional layers in CNNs. How do these layers help capture local spatial hierarchies in images?	10M	CO3	L3
OR				
7	Explain the variants of the basic convolution function, including dilated	10M	CO3	L2

	convolutions, transposed convolutions, and separable convolutions.			
8	Construct a model architecture based on the Encoder-Decoder framework for sequence-to-sequence tasks. Illustrate how this model can be applied to machine translation, and incorporate an attention mechanism to enhance its performance.	10M	CO4	L6
	OR			
9	Describe the working principle of Recursive Neural Networks. How are they different from Recurrent Neural Networks, and in what type of tasks are they most useful?	10M	CO4	L2
10	Provide an overview of common debugging strategies for machine learning models. How can techniques like data visualization, error analysis, and cross-validation assist in identifying issues with model performance?	10M	CO5	L3
	OR			
11	Explain how machine learning is applied to large-scale problems in fields such as computer vision, speech recognition, and natural language processing. Highlight the challenges and approaches used in these applications.	10M	CO5	L4