



B.Tech VII Semester Regular Examinations, November 2025

DEEP LEARNING

(CSE)

Maximum Marks: 60

Date: 24.11.2025

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)	How can you detect overfitting in a model? Mention at least two methods to reduce it.	1M	1	I
b)	Define bias and variance.	1M	1	I
c)	What is meant by "good local minima"?	1M	2	I
d)	How do saddle points affect training?	1M	2	I
e)	Write the mathematical formula for discrete convolution.	1M	3	III
f)	How does kernel size influence feature extraction?	1M	3	I
g)	What does it mean to "unfold" a computational graph in the context of RNNs?	1M	4	I
h)	What is the encoder-decoder architecture used for?	1M	4	I
i)	Why is cross-validation important in hyperparameter selection?	1M	5	I
j)	How can inspecting the gradient norms help debug training?	1M	5	I

Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	Bloom Tx
2	a) What is a learning algorithm?	5M	1	I
	b) Define vanishing and exploding gradients.	5M		
OR				
3	a) Explain the difference between shallow and deep architectures.	5M	1	II
	b) Derive the backpropagation equations for a simple 2-layer network.	5M		
4	a) Compare L1 and L2 regularization. How do they affect model weights differently?	5M	2	II
	b) What is the difference between data generation and augmentation?	5M		
OR				
5	a) What is the difference between bagging and boosting?	5M	2	I

	b) What are the main challenges in implementing adversarial training?	5M		I
6	a) Intricate the variants of basic convolution function. b) What are the limitations of random convolutional features?	5M 5M	3	I I
	OR			
7	a) How can convolution be adapted for time-series or sensor data? b) How do convolutional layers mimic biological visual processing systems?	5M 5M	3	I I
8	a) What is the basic structure of a Recurrent Neural Network? How do GRUs differ from LSTMs? b) How does learning rate scheduling affect long-term dependency learning?	5M 5M	4	I I
	OR			
9	a) Discuss the trade-off between memory capacity and model complexity. b) Explain the challenges of long term dependencies.	5M 5M	4	II II
10	a) What is a confusion matrix, and how is it used to interpret model performance? b) How do RNNs and LSTMs help in speech recognition?	5M 5M	5	I I
	OR			
11	a) What is the importance of computer vision in image processing? b) Explain the debugging strategies.	5M 5M	5	I II