

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2024

(Third Semester)

Branch - COMPUTER SCIENCE

MAJOR ELECTIVE COURSE-II : DEEP LEARNING

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Choose the main challenge in developing intelligent machines. a. Programming traditional algorithms b. Lack of interest in AI c. Abundance of robotic systems d. Solving complex computational problems	K1	CO1
	2	Relate the output of a strong prediction in a softmax layer. a. Many outputs close to 0 b. Single output close to 1 and others close to 0 c. All outputs close to 1 d. All outputs close to 0	K2	CO1
2	3	What does a squared error of zero indicate? a. The model is not learning b. The model is making a perfect prediction on the training example c. The training set is too small d. The weights are not updated	K1	CO2
	4	Interpret the term "epoch" in the context of training a neural network. a. A single iteration over a mini-batch of training data b. A single update of the network's weights and biases c. A single iteration over the entire training set d. A single forward pass through the network	K2	CO2
3	5	Find the primary drawback of the Torch deep learning framework. a. Not open-source b. Uses Lua, which is less common c. Limited community support d. No GPU support	K1	CO3
	6	What method is used to run operations in a TensorFlow session? a. graph.run() b. tf.run() c. sess.execute() d. sess.run()	K2	CO3
4	7	What problem did the Viola-Jones algorithm address? a. Object recognition in images b. Face detection in images c. Image segmentation d. Image classification	K1	CO4
	8	Interpret the two major parameters that define a pooling layer. a. Spatial extent and stride b. Activation function and number of filters c. Learning rate and batch size d. Input size and output size	K2	CO4
5	9	In a LEFT ARC operation, which element becomes the parent node? a. The leftmost element at the front of the stack b. The rightmost element at the front of the stack c. The element that was just shifted d. The first element in the buffer	K1	CO5
	10	How does beam search operate in terms of its two major phases? a. Input and analysis b. Selection and iteration c. Expansion and pruning d. Calculation and output	K2	CO5

Cont...

SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Examine the relationship between the biological neuron and the artificial neuron in terms of structure and functions.	K4	CO1
	(OR)			
	11.b.	Analyze the activation functions used in Deep Learning.		
2	12.a.	Interpret about the Delta rule and learning rates.	K5	CO2
	(OR)			
	12.b.	Explain the techniques used to prevent overfitting in deep neural networks.		
3	13.a.	Explain the creation and manipulation of TensorFlow variables in deep learning models.	K5	CO3
	(OR)			
	13.b.	Assess the effectiveness of the logistic regression model implemented in TensorFlow for classifying handwritten digits in the MNIST dataset.		
4	14.a.	Analyze the role of filters in convolutional neural networks and discuss how they mimic the feature detection process observed in the human visual cortex.	K4	CO4
	(OR)			
	14.b.	Examine the role of batch normalization and filter visualization in improving the performance of convolutional networks.		
5	15.a.	Discuss how the seq2seq model works in NLP and how Neural N-Grams can enhance it.	K6	CO5
	(OR)			
	15.b.	Elaborate on the role of recurrent layers in RNNs and how they differ from the layers found in traditional feed-forward networks.		

SECTION - C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Explain about Feed Forward Neural Networks.	K5	CO1
2	17	Discuss the algorithm which tackles the problem of training multilayer neural networks.	K6	CO2
3	18	Explain the construction of a multilayer model for MNIST dataset in TensorFlow.	K5	CO3
4	19	Analyze the characteristics and hyperparameters of a convolutional layer, and discuss their impact on the model's performance and output volume.	K4	CO4
5	20	Examine the architecture of the Long Short-Term Memory Units.	K4	CO5