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22SCS334

Third Semester M.Tech. Degree Examination, Dec.2023/Jan.2024
Deep Learning

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Define machine learning and provides a concise explanation of both machine learning tasks linear regression algorithm.	10	L2	CO1
	b.	Explain various supervised learning algorithms.	10	L2	CO1
		OR			
Q.2	a.	Define cross validation and provides a detailed explanation of the K-fold cross validation technique, including the algorithms steps involved in implementing it.	10	L2	CO1
	b.	Explain unsupervised learning algorithms.	10	L2	CO1
		Module – 2			
Q.3	a.	Explain gradient based learning with cost functions and output units.	10	L2	CO2
	b.	Describe the ensemble methods, bagging and dropout specially used in feed forward neural networks, highlighting their mechanism and contributions to model improvement.	10	L2	CO2
		OR			
Q.4	a.	Explain computational graph. Describe the steps to train neural network with back propagation.	10	L2	CO2
	b.	Describe L^2 and L^1 parameter regularization.	10	L2	CO2
		Module – 3			
Q.5	a.	Define optimization. Describe batch and mini batch algorithms. List the optimization challenges.	10	L2	CO2
	b.	Write and explain AdaGrad and the RMSProp algorithm. Mention their differences.	10	L2	CO2
		OR			
Q.6	a.	Describe convolution operation. How that can improve machine learning systems. With diagrams show the components of convolutional network layer.	10	L2	CO2
	b.	Write and explain Stochastic Gradient Descent (SGD) algorithm and momentum algorithm. Mention their benefits.	10	L2	CO2

Module – 4					
Q.7	a.	Explain Recurrent Neural Network (RNN). Illustrate unfolding of computational graphs.	10	L2	CO4
	b.	Discuss the architecture of Long Short Term Memory (LSTM) and other gated Recurrent Neural Network (RNNs).	10	L2	CO4
OR					
Q.8	a.	Explain Recursive Neural network with neat diagram. Illustrate the challenges of optimizing long term dependencies.	10	L2	CO4
	b.	Describe the architecture of Bidirectional Recurrent Neural Networks (bidirectional RNNs) and Encoder Decoder sequence-to-sequence architecture.	10	L2	CO4
Module – 5					
Q.9	a.	Explain performance metrics.	10	L2	CO3
	b.	Define speech recognition. Explain different speech recognition systems.	10	L2	CO4
OR					
Q.10	a.	Explain different approaches of choosing hyperparameters in deep learning models.	10	L2	CO3
	b.	Define natural language processing. Explain different natural language models.	10	L2	CO4

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