GUJARAT TECHNOLOGICAL UNIVERSITY
BE (Minor) - SEMESTER– VI EXAMINATION – WINTER 2023

Subject Code: 116AG01   **Date: 07-02-2024**

Subject Name: Deep Learning and Neural Network

Time: 02:30 PM TO 05:00 PM   **Total Marks: 70**

Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			Marks
Q.1	**(a)**	List out the key components found in a neural network.	**03**
	(b)	Explain the advantages and limitations of using neural networks in different applications.	**04**
	(c)	Differentiate between the types of neural networks and their respective functionalities.	**07**
Q.2	**(a)**	Define perceptron and its structure in neural network.	**03**
	(b)	Explain the concepts of overfitting and underfitting in neural network.	**04**
	(c)	Explain the relationship between the number of layers and the complexity of neural network tasks with appropriate example.	**07**
		OR	
	(c)	Explain in detail about the backpropagation algorithm used in Artificial Neural Networks.	**07**
Q.3	**(a)**	Explain the role of hidden layers in feature extraction within a neural network.	**03**
	(b)	Describe how the learning rate influences the convergence of a neural network during training.	**04**
	(c)	Explain how the structure of an RNN allows it to handle sequential data.	**07**
		OR	
Q.3	**(a)**	Define following terms: Accuracy, Precision, Recall.	**03**
	(b)	Explain the role of activation functions in the context of neural network training.	**04**
	(c)	Explain the concept of backpropagation through time (BPTT) to train an RNN for sequence prediction.	**07**
Q.4	**(a)**	Describe the role of data augmentation techniques.	**03**
	(b)	Classify different real-world applications where Recurrent Neural Networks (RNNs) are effectively utilized.	**04**
	(c)	Explain the impact of pooling layers on the spatial dimensions of the input data in CNNs.	**07**
		OR	
Q.4	**(a)**	Describe the concept of batch normalization.	**03**
	(b)	Discuss the role of the output gate in regulating the information output from an LSTM unit.	**04**
	(c)	How deep learning plays a significant role in traffic intelligence system. Explain with example.	**07**

Q.5 **(a)** List out the advantages of using Keras's functional API over its sequential API. **03**

(b) Explain steps to train RNN using TensorFlow. **04**

(c) Discuss the applications of TensorFlow in the deployment and serving of machine learning models. **07**

OR

Q.5 **(a)** List out the architectural components that differentiate LSTM from traditional recurrent neural networks. **03**

(b) Write the differences between eager execution and graph execution modes in TensorFlow. **04**

(c) Describe how Keras simplifies the process of building and training neural networks. **07**

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