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B.Tech/ M.Tech (Integrated) DEGREE EXAMINATION, MAY 2024
Fourth Semester

21MEE355T – ARTIFICIAL NEURAL NETWORK
(For the candidates admitted from the academic year 2022-2023 onwards)

Note:

- (i) **Part - A** should be answered in OMR sheet within first 40 minutes and OMR sheet should be handed over to hall invigilator at the end of 40th minute.
- (ii) **Part – B and Part - C** should be answered in answer booklet.

Time: 3 Hours

Max. Marks: 75

PART – A (20 × 1 = 20Marks)

Answer **ALL** Questions

	Marks	BL	CO	PO
1. The purpose of activation function	1	1	1	2.3
(A) To determine the strength of the synaptic connection				
(B) To regulate the output of each neuron				
(C) To control the speed of signals transmission				
(D) To amplify the input signals				
2. The type of ANN is typically used for image recognition tasks	1	1	1	2.3
(A) Feed forward neural network				
(B) Radial basis function network				
(C) Convolutional neural network				
(D) Recurrent neural network				
3. The weights adjusted the training of an ANN	1	1	1	2.3
(A) Through reinforcement learning				
(B) By backpropagation algorithm				
(C) By random assignment				
(D) Through supervised learning				
4. The neural network is design to work sequential data	1	1	1	2.3
(A) FNN				
(B) CNN				
(C) RNN				
(D) RBFN				
5. The LMS algorithm for training neural network	1	1	2	2.3
(A) It is computationally efficient and memory efficient				
(B) It always conveys to the global optimum				
(C) It is robust to noisy input data				
(D) It requires minimal lining of hyper parameters				
6. What pattern is observed in a learning curve as the training data set increases?	1	1	2	2.3
(A) Decreasing training error and increasing validation error				
(B) Increasing training error and decreasing validation error				
(C) Decreasing training error and decreasing validation error				
(D) Increasing training error and increasing validation error				

7. The purpose of back propagation in training neural network 1 1 2 2.3
 (A) To initialize the weight of the neural network (B) To propagate error backward through the network to adjust weight
 (C) To regularize the model and prevent overfitting (D) To prune unnecessary connections in the network
8. The main objective of cross-validation in machine learning 1 1 2 2,3
 (A) To train the model on a small subset of the data (B) To evaluate the performance of the model on unseen data
 (C) To optimize the hyper parameter of the model (D) To visualize the decision boundary of the model
9. The pruning strategy involved removing connections with small weight 1 1 3 2.3
 (A) Weight magnitude (B) Unit norm
 (C) Actuation based (D) Random
10. Which metric is commonly used to evaluate the performance of a model during cross validation? 1 1 3 2.3
 (A) Accuracy (B) Precision
 (C) Recall (D) F1-score
11. Objective of principal component analysis 1 1 3 2.3
 (A) To maximize the computational efficiency of data set (B) To identify the most significant features in the data set
 (C) To reduce the dimensionality of the data set while preserving its variance (D) To increase the complexity of the data set for better model performance
12. Eigen values and eigen vectors in PCA 1 1 3 2.3
 (A) The amount of variance explained by each principal component (B) The coefficients of linear combination features
 (C) The total sum of squares of the data set (D) The SD of the features in the data set
13. Actuation function is commonly used in the output of RBF network 1 1 4 2,3
 (A) Sigmoid (B) ReLU
 (C) Tanh (D) Linear
14. How are the weights of RBF network typically trained? 1 1 4 2.3
 (A) Using back propagation with gradient decent (B) By computing the eigen vector of the data matrix
 (C) Through reinforcement learning algorithm (D) By min and MSE between actual and prediction outputs
15. What problem can occur during training of RNN due to repeated application of the same weight matrix? 1 1 4 2.3
 (A) Exploding gradient problem (B) Vanishing gradient problem
 (C) Over fitting (D) Under fitting

16. How is convergence typically determined in the training of KSOM?	1	1	4	2.3
(A) When the number of neurons in the output layer reaches in predefines threshold				
(B) When the number of iterations exceeds a predefined limit				
(C) When the MSE between input and output is minimizing				
(D) When the input data is computing classified into clusters				
17. The following task are RNN particularly suitable for	1	1	5	2.3
(A) Image classification				
(B) Language translation				
(C) Object detection				
(D) Dimensionality reduction				
18. CNN are used for task	1	1	5	2.3
(A) Structured data				
(B) Time series data				
(C) NLP				
(D) Image recognition				
19. Primary operation in convolution layer	1	1	5	2.3
(A) Matrix multiplication				
(B) Element wise multiplication				
(C) Convolution				
(D) Pooling				
20. Layer in CNN typically follow after the convolution and pooling layer?	1	1	5	2.3
(A) Fully connected layer				
(B) Recurrent layer				
(C) Drop out layer				
(D) Activation layer				

PART – B (5 × 8 = 40 Marks)

Answer **ALL** Questions

	Marks	BL	CO	PO
21. a. Discuss the types of actuation function with case study.	8	2	1	1
(OR)				
b. Elaborate Hebbian and perceptron learning rule.	8	2	1	1
22. a. Elaborate perceptron conveyance theorem and linear separability.	8	3	2	3
(OR)				
b. Write multilayer perceptron and output representation.	8	3	4	3
23. a. Write the relevant case study about your domain of principal component analysis.	8	2	3	1
(OR)				
b. Discuss perturbation theory and discuss involved in the coding and natural images.	8	2	3	1
24. a. Discuss self organizing means with relevant case study in your domain.	8	2	4	3
(OR)				
b. Write the relationship between kernel SOM with relevant to your domain.	8	2	4	4

25. a. Explain Markov decision process with example. 8 2 5 1

(OR)

b. Explain Q-learning and its relevant example to your domain. 8 2 5 1

PART – C (1 × 15 = 15 Marks)

Marks BL CO PO

Answer **ANY ONE** Question

26. Explain the modulus of ANN and highlight their architecture applications, training, algorithm advantage and disadvantages. 15 2 1 2

27. Explain the radial basis function recurrent neural network, convolution neural network. 15 2 5 5

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