17872

BRAINWARE UNIVERSITY

Term End Examination 2025-2026
Programme – B.Tech.(RA)-2022
Course Name – Deep Learning
Course Code - OEC-ECR701B
(Semester VII)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) State the cause of the necessity of biological neural networks.

a) to solve tasks like machine vision & natural language processing
b) to apply heuristic search methods to find solutions of problem
c) to make smart human interactive & user friendly system
d) all of the mentioned

(ii) Select the optionfrom the following would have a constant input in each epoch of training a Deep Learning model.

a) Weight between input and hidden layer
b) Weight between hidden and output layer
c) Biases of all hidden layer neurons
d) Activation function of output layer

(iii) The input image has been converted into a matrix of size 28 X 28 and a kernel / filter of size 7 X 7. Determine the size of the convoluted matrix.

a) 20x20
b) 21x21
c) 22x22
d) 25x25

(iv) Recall that CNN is best suited for________________

a) Image Classification
b) Natural Language Processing
c) Image Captioning
d) All of these

(v) Assume a simple MLP model with 3 neurons and inputs=1,2, The weights of the input neurons are 4,5, and 6 respectively. Assume the activation function is a linear constant Determine the value of output.

a) 64
b) 128
c) 32
d) 96

(vi) Identify the most direct application of neural networks-

a) vector quantization
b) pattern mapping
c) pattern classification
d) control applications

(vii) State the cause of the necessity of biological neural networks in artificial Intelligence.

a) to solve tasks like machine vision & natural language processing
b) to apply heuristic search methods to find solutions of problem
c) to make smart human interactive & user friendly system
d) all of the mentioned

(viii) Select the example of an unsupervised feature map:

a) text recognition
b) voice recognition
c) image recognition
d) none of the mentioned

(ix) Indicate a Boltzman machine from the following:

a) A feedback network with hidden units
b) A feedback network with hidden units and probabilistic update
c) A feed forward network with hidden units
d) A feed forward network with hidden units and probabilistic update

(x) The trajectory of the state is determined by.

a) activation dynamics
b) synaptic dynamics
c) both activation and synaptic dynamics
d) none of the mentioned

(xi) Identify which model, between MLFNN (Multilayer Feedforward Neural Network) and Basis function, takes more time for pattern recall.

a) MLFNN
b) Basis function
c) Equal for both MLFNN and basis function
d) None of the mentioned

(xii) Express the function of PNN -

a) function approximation task
b) pattern classification task
c) function approximation and pattern classification task
d) none of the mentioned

(xiii) Identify the way of input layer units connected to second layer in competitive learning networks.

a) feedforward manner
b) feedback manner
c) feedforward and feedback
d) feedforward or feedback

(xiv) Memorize that the Interpolative behaviour is.

a) not a type of pattern clustering task
b) for small noise variations pattern lying closet to the desired pattern is recalled.
c) for small noise variations noisy pattern having parameter adjusted according to noise variation is recalled
d) none of the mentioned

(xv) State the full form of RNN

a) Receives neural networks
b) Report neural networks
c) Recording neural networks
d) Recurrent neural networks

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Discuss the Perceptron training rule. (3)

3. Explain a Multi-layer Perceptron(MLP). (3)

4. Write the algorithm for Back propagation. (3)

5. (3)

State the Deep Learning frameworks and tools that you have used.

6. Compare a fully connected layer and a convolutional layer. (3)

OR

(3)

Illustrate why do we use the Convolutional Neural Network (CNN) for image data and not the Feedforward Neural Network (FNN)?

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain Boltzmann Machine. (5)
8. Explain a deep neural network. (5)
9. (5)

Explain the different layers of CNN.

10. Explain Bias and Variance in a Machine Learning Model. (5)

11. Illustrate the following terms: batch, mini-batch, and stochastic gradient descent. (5)

12. Explain in detail about the deep autoencoders. (5)

OR

Explain the three steps to developing the necessary assumption structure in Deep learning. (5)

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