# BRAINWARE UNIVERSITY

### Term End Examination 2024-2025
### Programme – MCA-2023
### Course Name – Deep Learning
### Course Code - MCA402B
### ( Semester IV )

**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) Identify the correct option ,If input is ' a(l) + e ' where 'e' is the noise introduced, then what is the output if system is interpolative in nature?

a) a(l)                                         b) a(l) + e
c) could be either a(l) or a(l) + e             d) e

(ii) Identify the correct option that is one of the application of associative memories.

a) Direct pattern recall                        b) Voice signal recall
c) Mapping of the signal                        d) Image pattern recall from noisy clues

(iii) Choose the way how can optimization be applied in images.

a) by use of simulated annealing                b) by attaching a feedback network
c) by adding an additional hidden layer         d) none of the mentioned

(iv) Feedback networks are used for

a) autoassociation                              b) pattern storage
c) both autoassociation & pattern storage       d) none of the mentioned

(v) Select the neural network that has only one hidden layer between the input and output.

a) Shallow neural network                       b) Deep neural network
c) Feed-forward neural networks                 d) Recurrent neural networks

(vi) Predict the action 'STACK(A, B)' of a robot arm specify to

a) Place block B on Block A                      b) Place blocks A, B on the table in that order
c) Place blocks B, A on the table in that order  d) Place block A on block B

(vii) Choose the correct option from the statements that Computers are best at learning

a) facts                                        b) concepts
c) Procedures                                   d) principles.

(viii) The Dimensionality Reduction estimates

a) Projection                                   b) Feature Selection

c) Feature Extraction

d) all of the mentioned

(ix) Determine from the following that is a regression task.

a) Predict the age of a person

b) Predict the country from where the person comes from

c) Predict whether the price of petroleum will increase tomorrow

d) Predict whether a document is related to science

(x) The Hopfield model is considered as

a) fully connected feedback network

b) fully connected feedback network with symmetric weights

c) fully connected feedforward network

d) fully connected feedback network with symmetric weights

(xi) The problem of identifying hidden structure in unlabeled data is called_____.

a) unsupervised learning

b) reinforcement learning

c) supervised learning

d) None

(xii) Select the case a sentence parser typically is used for.

a) It is used to parse sentences to check if they are utf-8 compliant.

b) It is used to parse sentences to derive their most likely syntax tree structures.

c) It is used to parse sentences to assign POS tags to all tokens.

d) It is used to check if sentences can be parsed into meaningful tokens.

(xiii) Convergence in perceptron learning is evaluated if and only if:

a) a minimal error condition is satisfied

b) actual output is close to desired output

c) classes are linearly separable

d) all of the mentioned

(xiv) Define the objective of backpropagation algorithm.

a) to develop learning algorithm for multilayer feedforward neural network

b) to develop learning algorithm for single layer feedforward neural network

c) to develop learning algorithm for multilayer feedforward neural network, so that network can be trained to capture the mapping implicitly

d) none of the mentioned

(xv) Choose the way how can learning process be stopped in backpropagation rule.

a) there is convergence involved

b) no heuristic criteria exist

c) on basis of average gradient value

d) none of the mentioned

## Group-B
### (Short Answer Type Questions)
3 x 5=15

2. Define the sigmoid function. (3)
3. Illustrate the best algorithm for face detection. (3)
4. Explain the procedure of training hyperparameters in a neural network. (3)
5. Explain the concepts of Dropout and Batch Normalization in the context of training deep neural networks. (3)
6. Is it possible to predict whether the learning rate for a model can be calculated a priori? (3)

**OR**

What do you understand by end-to-end learning? (3)

## Group-C
### (Long Answer Type Questions)
5 x 6=30

7. Differentiate between multi-class and multi-label classification problems. (5)
8. Illustrate Decision Tree in Machine Learning. (5)
9. Describe Cluster Sampling. (5)
10. Distinguish between the Multi-task Deep Learning and Multi-view Deep Learning (5)

11. Express the cost function. (5)
12. Explain dimension reduction in machine learning. (5)

**OR**

Explain Conditional Probability. (5)

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*