

DEPARTMENT OF INFORMATION TECHNOLOGY
YEAR/SEM: III/VI
23CSX502 – DEEP LEARNING AND NEURAL NETWORKS
QUESTION BANK

UNIT I
INTRODUCTION TO NEURAL NETWORK

Neural Networks Basics - Functions in Neural networks – Classification and Clustering problems - Deep networks basics - Shallow neural networks – Deep Neural Networks – Forward and Back Propagation. Deep Learning Frameworks – Data Augmentation - Underfitting- Overfitting.

PART- A

S.No.	Questions	Knowledge Level
1	Neural Networks Basics Define an artificial neuron.	K1
2	List the main components of a neural network.	K1
3	How is the input layer defined in a neural network?	K1
4	How do hidden layers contribute to learning in neural networks?	K2
5	Functions in Neural Networks State the purpose of an activation function.	K1
6	Why is non-linearity important in neural networks?	K2
7	List any two commonly used activation functions.	K1
8	Define a loss function.	K1
9	Classification and Clustering Problems How does supervised learning differ from unsupervised learning?	K2
10	What is meant by classification problem in neural networks?	K2
11	What is a clustering problem in neural networks?	K2
12	Deep Networks Basics What is meant by deep networks?	K1
13	Why are multiple hidden layers required in deep networks?	K2
14	Shallow and Deep Neural Networks How do shallow neural networks differ from deep neural networks?	K2
15	Why are deep neural networks suitable for complex problems?	K2
16	Forward and Back Propagation Define forward propagation.	K1
17	What is back propagation?	K1
18	Data Augmentation What is meant by data augmentation?	K2
19	How does data augmentation improve model performance?	K2
20	Underfitting and Overfitting Define underfitting in neural networks.	K1
21	Define overfitting in neural networks.	K1
22	What is one cause of underfitting?	K2
23	What is one cause of overfitting?	K2
24	Deep Learning Frameworks List any two deep learning frameworks.	K1
25	Why are deep learning frameworks used in neural network development?	K2

Training Concepts and Applications

26	What is meant by gradient descent?	K2
27	What is meant by model generalization?	K1
28	How is an epoch used during neural network training?	K2
29	Give two examples of loss functions.	K1
30	List any two applications of neural networks.	K1

PART- B

1	Describe Neural Networks and their working with suitable diagrams.	16	K2
2	Compare supervised, unsupervised, and reinforcement learning with examples.	16	K3
3	Explain perceptron, single-layer perceptron, and multi-layer perceptron with an example.	16	K2
4	a. Analyze the process of training hidden layers by ReLU in Deep Networks. b. Illustrate the working of backpropagation algorithm with an example.	8	K3
5	Explain the architecture of Artificial Neural Networks (ANN).	16	K2
6	Evaluate the use of regularization in machine learning and justify the difference between L1 and L2 regularization.	16	K4
7	Describe activation functions and their types used in neural networks.	16	K2
8(ii)	Consider the following five training example	8	K4

X	Y
2	8.8978
3	11.7586
4	15.3192
5	18.3129
6	20.1351

We want to learn the function $f(x)$ of the form $(x)=ax+b$ which is parameterized (a,b) . Using squared error as the loss function which of the following parameters would you use to model this function to get a solution with minimum loss? (4,3), (1,4), (4,1) (3,4).

8(ii)	For the given network shown in figure, analyze and compute the net input to the output neuron Y by considering the contribution of each input weight.	8	K4
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