SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)
SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF MEDICAL ELECTRONICS

QUESTION BANK

VIII SEMESTER

1910805 - NEURAL NETWORKS AND ITS APPLICATIONS

Regulation – 2019

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SUBJECT : NEURAL NETWOKS AND ITS APPLICATIONS
SEM/YEAR : VIII/IV

UNIT - I
FROM BIOLOGY TO ARTIFICIAL NEURAL NETWORKS - INTRODUCTION

Brief History of Neural Networks, Biological Neural Networks, Components of Artificial Neural Networks – Connections, Propagation function and Network Inputs, Common Activation Functions, Threshold, Network Topologies, Bias Neuron, Fundamentals of Learning and Training – Supervised, Unsupervised, Reinforcement, Training Pattern and Teaching Input, Learning Curve and Error measurement.

PART – A

Q.No	Question	CO's	BT LEVEL	Competence
1	Define artificial neural network.	CO1	BTL-1	Remembering
2	Differentiate between ANN and BNN.	CO1	BTL-2	Understanding
3	Sketch the different parts of human brain.	CO1	BTL-1	Remembering
4	Categorize the model of an artificial neuron network.	CO1	BTL-2	Understanding
5	Summarize the Neural Network architecture.	CO1	BTL-2	Understanding
6	Express the Activation function with formula.	CO1	BTL-2	Understanding
7	Classify the types of activation function.	CO1	BTL-2	Understanding
8	Mention the types of sigmoid function.	CO1	BTL-1	Remembering
9	Establish the application of Neural Networks.	CO1	BTL-2	Understanding
10	Outline the function of synaptic gap.	CO1	BTL-2	Understanding
11	What are dendrites?	CO1	BTL-1	Remembering
12	Define bias neuron.	CO1	BTL-1	Remembering
13	Sketch the simple model for an artificial neuron.	CO1	BTL-2	Understanding
14	What are fundamental building blocks of the BNN	CO1	BTL-1	Remembering
15	Difference between supervised and unsupervised learning.	CO1	BTL-2	Understanding
16	Name the two learning rules.	CO1	BTL-1	Remembering
17	What is the purpose of a bias neuron in a neural network?	CO1	BTL-1	Remembering
18	Explain about 'synapse'.	CO1	BTL-1	Remembering
19	Point out the applications of ANN with an example.	CO1	BTL-2	Understanding
20	Mention a typical McCulloch-Pitts neuron model.	CO1	BTL-2	Understanding
21	Classify the 4 types of learning curves.	CO1	BTL-2	Understanding
22	Compute the training in neural network.	CO1	BTL-2	Understanding
23	What are different types of learning rules?	CO1	BTL-1	Remembering
24	Calculate the Euclidean distance between two vectors.	CO1	BTL-2	Understanding

PART – B					
1	Explain the organization of human brain.	13	CO1	BTL-3	Applying
2	Describe the functioning of biological neuron and how it is related with ANN.	13	CO1	BTL-3	Applying
3	How artificial neuron is inspired from the biological neuron? Explain in detail.	13	CO1	BTL-3	Applying
4	Estimate the basic architecture of McCulloch – Pitts neuron model and also realize 3-input NAND gate using McCulloch – Pitts model.	13	CO1	BTL-4	Analyzing
5	Describe in detail about different activation functions used in neural networks.	13	CO1	BTL-3	Applying
6	Illustrate threshold function is not used as activation function in Multi-Layer Feed Forward Networks.	13	CO1	BTL-3	Applying
7	Discriminate the supervised learning and unsupervised learning algorithm.	13	CO1	BTL-4	Analyzing
8	Manipulate the perceptron learning rule and delta learning rule.	13	CO1	BTL-3	Applying
9	Describe reinforcement learning methods in detail.	13	CO1	BTL-3	Applying
10	Determine the neural representation of NAND logic gates using perceptron rule.	13	CO1	BTL-3	Applying
11	Summarize the perceptron and its features.	13	CO1	BTL-4	Analyzing
12	Describe McCulloch-Pitts neuron model in detail.	13	CO1	BTL-3	Applying
13	Determine the functioning of Rosenblatt perceptron.	13	CO1	BTL-3	Applying
14	Explain types of activation function and describe the neural dynamics.	13	CO1	BTL-2	Understanding
15	Design a perceptron to implement the truth table of AND gate by using bipolar inputs and target.	13	CO1	BTL-4	Analyzing
16	Describe the four different types of learning curves.	13	CO1	BTL-3	Applying
17	Analyze the strengths and limitations of each paradigm in terms of training pattern and teaching input.	13	CO1	BTL-4	Analyzing
PART – C					
1	Illustrate the various application of neural network in detail.	15	CO1	BTL-3	Applying
2	Estimate the neural representation of XOR logic gate using perceptron algorithm rule.	15	CO1	BTL-4	Analyzing
3	Develop a supervised learning algorithm and explain in detail with an example.	15	CO1	BTL-3	Applying
4	Describe the different learning mechanisms used in artificial neural networks.	15	CO1	BTL-3	Applying
5	Explain SVM classifier with suitable example.	15	CO1	BTL-3	Applying

UNIT - II: SUPERVISED NETWORK LEARNING PARADIGMS

Perceptron and back propagation – Single Layer Perceptron, Convergence theorem, delta rule, Linear Separability, Multilayer Perceptron, Back propagation of error, variation and extension to backpropagation. Recurrent perceptron like networks.

PART – A

Q.No	Question	CO's	BT LEVEL	Competence
1	Name the types of supervised learning.	CO2	BTL-1	Remembering
2	Write the significance of learning paradigm.	CO2	BTL-1	Remembering
3	Why is single layer perceptron(SLP) used?	CO2	BTL-2	Understanding
4	Define the term perceptron.	CO2	BTL-1	Remembering
5	Generalize the multi layer ANN.	CO2	BTL-2	Understanding
6	Define the term "back propagation".	CO2	BTL-1	Remembering
7	Outline the basic architecture of single layer perceptron.	CO2	BTL-2	Understanding
8	Why delta rule is preferred much than learning rule in neural network?	CO2	BTL-2	Understanding
9	What are the 4 parts of perceptron?	CO2	BTL-2	Understanding
10	Difference between propagation and backpropagation.	CO2	BTL-1	Remembering
11	Define Momentum and local minima in terms of neural networks.	CO2	BTL-1	Remembering
12	Distinguish between single layer perceptron and multi layer perceptron.	CO2	BTL-2	Understanding
13	What are the three main paradigms of machine learning?	CO2	BTL-2	Understanding
14	Why is it called backpropagation?	CO2	BTL-3	Applying
15	Which rule is followed by the backpropagation algorithm?	CO2	BTL-1	Remembering
16	What is the convergence theorem of neural networks?	CO2	BTL-1	Remembering
17	Recognize the delta rule.	CO2	BTL-1	Remembering
18	What is error back propagation in neural network?	CO2	BTL-1	Remembering
19	Estimate the efficiency of backpropagation in training neural networks	CO2	BTL-2	Understanding
20	Explain the four main steps in back propagation algorithm	CO2	BTL-2	Understanding
21	Name the variations to backpropagation algorithm.	CO2	BTL-2	Understanding
22	How do you calculate backpropagation error?	CO2	BTL-2	Understanding
23	Name the examples of recurrent neural networks.	CO2	BTL-2	Understanding
24	Write the limitations of recurrent neural networks.	CO2	BTL-1	Remembering

PART – B

1	Describe the performance of back propagation learning algorithm and how applied to ANN applications.	13	CO2	BTL-3	Applying
2	Estimate the concepts of Perceptron training rule in the context of neural networks.	13	CO2	BTL-4	Analyzing
3	Elaborate a few tasks that can be performed by a back propagation network.	13	CO2	BTL-3	Applying
4	Discriminate the generalized delta rule and the upgradation of hidden layer and output layer.	13	CO2	BTL-4	Analyzing
5	Analyze the XOR is not linearly separable? Justify how it can be solved	13	CO2	BTL-4	Analyzing
6	Explain the algorithm of BPN with its Architecture.	13	CO2	BTL-3	Applying
7	a) Explain back propagation nonlinear regression.	7	CO2		
	b) Compare Linear Vs nonlinear regression.	6		BTL-3	Applying
8	Explain the steps involved in perceptron convergence	13	CO2	BTL-3	Applying

	theorem for ANN.				
9	Explain the architecture and algorithm of SLP in detail.	13	CO2	BTL-3	Applying
10	Manipulate the gradient descent and the delta rule in back propagation algorithm.	13	CO2	BTL-3	Applying
11	Explain a few tasks that can be performed by a back propagation network.	13	CO2	BTL-4	Analyzing
12	Describe back propagation and features of back propagation.	13	CO2	BTL-3	Applying
13	Examine the perceptron learning rule and delta learning rule.	13	CO2	BTL-3	Applying
14	Explain briefly the back propagation techniques with steps.	13	CO2	BTL-3	Applying
15	Describe the trade-offs and challenges associated with the variations and extensions to backpropagation.	13	CO2	BTL-4	Analyzing
16	Design Back propagation using Multi-Layer Perception which has three layers like the input layer has 4 neurons, the hidden layer has 2 neurons and the output layer has a single neuron. Train the MLP by updating the weights and biases in the network. Learning rate: =0.8.	13	CO2	BTL-4	Analyzing
17	Derive the decision line of AND gate using Perceptron rule.	13	CO2	BTL-3	Applying
	PART – C				
1	Describe the step by step procedure of back propagation learning algorithm in detail.	15	CO2	BTL-3	Applying
2	Design single layer perceptron with two iteration. Consider the perceptron having with the initial weights w1=0.5, w2 = 0, learning rate α=0.2 and bias $^{\theta}$ =0.4 for AND Boolean function. The activation function is the Step function f(x) which gives the output either 0 or 1. If value of f(x) is greater than or equal to 0, it outputs 1 or else it outputs 0.	15	CO2	BTL-3	Applying
3	Analyse the factors affecting MLP performance and explain each.	15	CO2	BTL-4	Analyzing
4	Explain the stages involved in training a neural net using Back propagation algorithm.	15	CO2	BTL-3	Applying
5	Express how back propagation can be used to solve Ex-OR problem which is not linearly separable.	15	CO2	BTL-4	Analyzing

UNIT - III: ASSOCIATIVE NETWORK AND NETWORK BASED ON COMPETITION

Evolution of Medical Standards – IEEE 11073 - HL7 – DICOM – IRMA - LOINC – HIPPA. Computer based Patient Records-History taking by computer, Dialogue with the computer, Components and functionality of CPR, Development tools, CPR in Radiology, Clinical information system, Computerized prescriptions for patients.

Q.No	Question	CO's	BT LEVEL	Competence
1	What is IEEE 11073 in health informatics?	CO3	BTL-1	Remembering
2	Define HL7 standards.	CO3	BTL-1	Remembering
3	Difference between Dicom and HL7.	CO3	BTL-2	Understanding
4	State the term computer based patient record.	CO3	BTL-1	Remembering
5	How do you take patient family history?	CO3	BTL-2	Understanding
6	Identify the key components of a CPR system.	CO3	BTL-2	Understanding

7	What are the impact of a computer based patient record systems?		CO3	BTL-1	Remembering
8	Name the major functions of CPR.		CO3	BTL-1	Remembering
9	Mention the 7 steps of CPR are followed in medical technology.		CO3	BTL-2	Understanding
10	Outline the main tools used in the development of computer-based patient records.		CO3	BTL-1	Remembering
11	Identify the role of dialogue with the computer in healthcare systems.		CO3	BTL-2	Understanding
12	List the key components involved in a dialogue between the computer and healthcare professionals.		CO3	BTL-1	Remembering
13	Name the common development tools used in creating computer-based patient record systems.		CO3	BTL-2	Understanding
14	What are the primary components and functionalities of CPR in radiology?		CO3	BTL-2	Understanding
15	What is the primary purpose of a computer-based patient record (CPR)?		CO3	BTL-2	Understanding
16	CPR" in the context of radiology, explain its role in medical imaging.		CO3	BTL-3	Applying
17	State the advantages and challenges associated with implementing CPR in radiology.		CO3	BTL-2	Understanding
18	Determine the overall impact of CPR in radiology		CO3	BTL-2	Understanding
19	Define associative memory.		CO3	BTL-1	Remembering
20	List out different types of associative memories.		CO3	BTL-2	Understanding
21	What is the primary purpose of a Clinical Information System (CIS)?		CO3	BTL-1	Remembering
22	Define Energy function in Auto associative memory.		CO3	BTL-1	Remembering
23	Name the two common features of a Clinical Information System.		CO3	BTL-1	Remembering
24	Write the significance of "Clinical Information System (CIS)"		CO3	BTL-2	Understanding
PART – B					
1	Explain the significance of IEEE 11073 in the evolution of medical standards.	13	CO3	BTL-3	Applying
2	Describe the key components and functionalities of Computer Based Patient Records (CPR) for ANN.	13	CO3	BTL-3	Applying
3	Develop a plan for integrating clinical information systems for better patient care coordination.	13	CO3	BTL-3	Applying
4	Examine the potential benefits and drawbacks of implementing CPR in radiology, considering factors such as workflow efficiency and data accuracy.	13	CO3	BTL-4	Analyzing
5	Describe the impact of IRMA on enhancing communication and data exchange in healthcare.	13	CO3	BTL-4	Analyzing
6	Elaborate on how HIPAA compliance ensures patient data security and privacy.	13	CO3	BTL-3	Applying
7	Compare and contrast HL7 and DICOM standards in the healthcare domain.	13	CO3	BTL-4	Analyzing
8	Define HIPAA and outline its importance in protecting patient information.	13	CO3	BTL-3	Applying

9	Describe the relationship between the components of CPR and the overall functionality of the system.	13	CO3	BTL-4	Analyzing
10	Explain the significance of the components and functionalities of CPR in facilitating healthcare workflows.	13	CO3	BTL-3	Applying
11	Explain the role of development tools in ensuring the efficiency and reliability of computer-based patient record systems.	13	CO3	BTL-3	Applying
12	Compare and contrast different development tools used in creating computer-based patient records, considering their strengths and limitations.	13	CO3	BTL-4	Analyzing
13	Describe the significance of Clinical Information Systems in enhancing patient care.	13	CO3	BTL-3	Applying
14	Explain how associative networks facilitate information retrieval and pattern recognition.	13	CO3	BTL-4	Analyzing
15	Explain how Associative memories work based on hamming distance.	13	CO3	BTL-4	Analyzing
16	Describe the effectiveness of an associative network in handling complex cognitive tasks.	13	CO3	BTL-4	Analyzing
17	Illustrate a practical application of Computerized Prescriptions to demonstrate its impact on patient safety.	13	CO3	BTL-4	Analyzing
PART – C					
1	Apply the principles of IEEE 11073 to a scenario where medical devices need to communicate seamlessly.	15	CO3	BTL-3	Applying
2	Assess the overall reliability and security of development tools used in creating computer-based patient record systems.	15	CO3	BTL-3	Applying
3	Describe a scenario that demonstrates the application of a competitive network in pattern recognition tasks.	15	CO3	BTL-3	Applying
4	Develop a scenario demonstrating the practical application of CPR components in a patient care setting.	15	CO3	BTL-4	Analyzing
5	Establish the unique challenges and considerations involved in implementing CPR in radiology compared to other medical specialties.	15	CO3	BTL-3	Applying

UNIT - IV: OTHER ADVANCE NEURAL NETWORKS

Radial Basis Functions, Support Vector Machines, Extreme Learning Machine, Extended Extreme Learning Machine, Principle component Analysis, Deep Learning and Hierarchical Temporal Memory.

PART –A

Q.No	Question	CO's	BT LEVEL	Competence
1	What is the primary function of Radial Basis Functions (RBF) in neural networks?	CO4	BTL-2	Understanding
2	Explain the fundamental principles of Radial Basis Functions (RBF) in machine learning.	CO4	BTL-1	Remembering
3	Mention the applications and advantages of RBF.	CO4	BTL-2	Understanding
4	What is radial basis functions give its equation?	CO4	BTL-1	Remembering
5	How does RBF works?	CO4	BTL-2	Understanding
6	What are the advantages of RBF kernel?	CO4	BTL-2	Understanding

7	State the cost function of RBF.		CO4	BTL-1	Remembering
8	Define Support Vector Machines (SVM) in neural networks.		CO4	BTL-2	Understanding
9	Distinguish between ANN and SVM.		CO4	BTL-2	Understanding
10	Why SVM is better than neural network?		CO4	BTL-2	Understanding
11	What type of neural network is SVM?		CO4	BTL-2	Understanding
12	Draw the structure of SVM and neural networks.		CO4	BTL-2	Understanding
13	What is meant by Extreme Learning Machine (ELM)?		CO4	BTL-1	Remembering
14	What is the difference between ELM and deep learning?		CO4	BTL-2	Understanding
15	Estimate the role of activation functions in deep learning models.		CO4	BTL-2	Understanding
16	Explain the concept of overfitting in deep learning.		CO4	BTL-1	Remembering
17	Mention difference between ELM and MLP?		CO4	BTL-2	Understanding
18	What are the primary goal of Principle Component Analysis (PCA)?		CO4	BTL-1	Remembering
19	State the Principle Component Analysis (PCA) in dimensionality reduction.		CO4	BTL-2	Understanding
20	Comparison between PCA and dimensionality reduction.		CO4	BTL-2	Understanding
21	Difference between machine learning and deep learning for object detection.		CO4	BTL-2	Understanding
22	Mention the three types of deep learning.		CO4	BTL-2	Understanding
23	Distinguish between DNN and CNN.		CO4	BTL-2	Understanding
24	Explain the concept of feature representation in deep learning and its significance.		CO4	BTL-2	Understanding
PART B					
1	Compare and contrast Radial Basis Functions (RBF) with other machine learning algorithms.	13	CO4	BTL-4	Analyzing
2	Explain the fundamental principles of Radial Basis Functions (RBF) in machine learning.	13	CO4	BTL-3	Applying
3	Briefly describe the main objective of Support Vector Machines (SVM) in machine learning.	13	CO4	BTL-3	Applying
4	Compare linear and nonlinear Support Vector Machines (SVM) in terms of their strengths, weaknesses, and applications.	13	CO4	BTL-4	Analyzing
5	Summarize the main purpose of Extreme Learning Machine (ELM) in neural networks.	13	CO4	BTL-3	Applying
6	Mention the advantages and limitations, and provide examples of domains where ELM has been successfully applied.	13	CO4	BTL-3	Applying
7	Compare Extreme Learning Machine (ELM) with traditional neural networks in terms of training speed, generalization performance, and model complexity.	13	CO4	BTL-4	Analyzing
8	Explain the implications of ELM in handling big data.	13	CO4	BTL-4	Analyzing
9	Analyze the examples to illustrate the practical benefits of using EELM in machine learning tasks.	13	CO4	BTL-4	Analyzing
10	Summarize the primary goal of Principle Component Analysis (PCA) in dimensionality reduction.	13	CO4	BTL-3	Applying
11	Derive the mathematical foundations of PCA, including eigenvectors and eigenvalues.	13	CO4	BTL-3	Applying

12	Determine how PCA is applied in various domains and its implications on preserving data variance.	13	CO4	BTL-3	Applying
13	Explain the applications and challenges associated with Deep Learning.	13	CO4	BTL-3	Applying
14	Define the main characteristics that distinguishes Deep Learning from traditional machine learning approaches.	13	CO4	BTL-4	Analyzing
15	Summarize the primary purpose of Hierarchical Temporal Memory (HTM) in machine learning.	13	CO4	BTL-3	Applying
16	Explain the key principles of Hierarchical Temporal Memory (HTM) in NN.	13	CO4	BTL-3	Applying
17	Compare Hierarchical Temporal Memory (HTM) with traditional neural network models in terms of its architecture.	13	CO4	BTL-4	Analyzing
1	Summarize the training algorithm for the RBF NN with its flowchart.	15	CO4	BTL-4	Analyzing
2	Provide an overview of the architecture and training process of Extreme Learning Machines (ELM).	15	CO4	BTL-3	Applying
3	Compare the architecture and performance of Extended Extreme Learning Machine (EELM) with standard ELM.	15	CO4	BTL-4	Analyzing
4	Explain the core principles of Principle Component Analysis (PCA) and its applications in feature extraction and data compression.	15	CO4	BTL-3	Applying
5	Describe the impact of different neural network architectures and activation functions on the performance of deep learning models.	15	CO4	BTL-3	Applying

UNIT - V: APPLICATION OF NEURAL NETWORKS

ANN in Computer-Aided Diagnosis, ANN as multivariate statistical model, ANN for medical Image segmentation, ANN as a predictive model, ANN as an optimizer.

PART – A

Q.No	Question	CO's	BT LEVEL	Competence
1	Define the role of Artificial Neural Networks (ANN).	CO5	BTL-1	Remembering
2	List out the applications of ANN in healthcare.	CO5	BTL-1	Remembering
3	State the principle of ANN.	CO5	BTL-1	Remembering
4	Name the three applications of AI in healthcare.	CO5	BTL-2	Understanding
5	What are the primary purpose of using ANN for medical image segmentation?	CO5	BTL-2	Understanding
6	Why sigmoid function is also called as squashing function?	CO5	BTL-2	Understanding
7	What is the significance of weights used ANN.	CO5	BTL-1	Remembering
8	What is the role of ANN in Artificial Intelligence?	CO5	BTL-1	Remembering
9	Mention two benefits of using ANNs in CAD systems compared to traditional methods.	CO5	BTL-2	Understanding
10	Identify a limitation of using ANNs in Computer-Aided Diagnosis.	CO5	BTL-2	Understanding
11	Mention the three categories of multivariate analysis.	CO5	BTL-1	Remembering

12	Which neural network is best for medical image classification?		CO5	BTL-2	Understanding
13	Why is CNN better than RNN for image classification?		CO5	BTL-2	Understanding
14	Name the two approaches of image segmentation.		CO5	BTL-1	Remembering
15	What is meant by image segmentation.		CO5	BTL-1	Remembering
16	Examine the common sources of error in neural network.		CO5	BTL-2	Understanding
17	Describe the basic steps involved in training a neural network.		CO5	BTL-2	Understanding
18	Comparison of multivariate models with traditional statistical approaches.		CO5	BTL-2	Understanding
19	Identify the advantages of using ANNs for medical image segmentation.		CO5	BTL-2	Understanding
20	Sketch the architecture used in ANNs for medical image segmentation.		CO5	BTL-2	Understanding
21	Mention the role of features in training ANNs for predictive modeling.		CO5	BTL-2	Understanding
22	Compare the role of traditional optimizers with ANNs in machine learning.		CO5	BTL-2	Understanding
23	Define the term "ANN as an optimizer"		CO5	BTL-1	Remembering
24	Differentiate between feedforward and recurrent neural networks.		CO5	BTL-2	Understanding
	PART – B				
1	Examine how Artificial Neural Networks (ANN) are utilized in Computer-Aided Diagnosis.	13	CO5	BTL-3	Applying
2	Compare the effectiveness of Artificial Neural Networks (ANN) in Computer-Aided Diagnosis with traditional diagnostic methods.	13	CO5	BTL-4	Analyzing
3	Summarize the key role of Artificial Neural Networks (ANN) as a multivariate statistical model.	13	CO5	BTL-4	Analyzing
4	Explain how Artificial Neural Networks (ANN) function as multivariate statistical models.	13	CO5	BTL-3	Applying
5	Explain the advantages and limitations of using ANN in comparison to traditional statistical models.	13	CO5	BTL-3	Applying
6	Briefly describe the historical development of Artificial Neural Networks.	13	CO5	BTL-3	Applying
7	Describe factors such as accuracy, generalization, and adaptability to different medical imaging domains.	13	CO5	BTL-4	Analyzing
8	Describe the challenges associated with deploying ANN in real-time applications.	13	CO5	BTL-4	Analyzing
9	Elaborate the impact of hyperparameters and optimization techniques on the segmentation accuracy.	13	CO5	BTL-4	Analyzing
10	Explain the principles behind using Artificial Neural Networks (ANN) for predictive modeling.	13	CO5	BTL-3	Applying
11	Compare the predictive capabilities of Artificial Neural Networks (ANN) with traditional statistical models.	13	CO5	BTL-4	Analyzing
12	Explain the specific architectures used in ANN for Computer aided diagnosis.	13	CO5	BTL-3	Applying
13	Illustrate the impact of using ANN as an optimizer on the	13	CO5	BTL-3	Applying

	overall performance of neural networks.				
14	Design a conceptual architecture for an ANN-based medical image segmentation system.	13	CO5	BTL-3	Applying
15	Explain the factors such as accuracy, generalization, and adaptability to different medical imaging domains.	13	CO5	BTL-4	Analyzing
16	Evaluate the impact of using ANN in real-time applications compared to traditional approaches.	13	CO5	BTL-4	Analyzing
17	Explain the fundamental principles that enable ANN to be used in real-time scenarios.	13	CO5	BTL-3	Applying
PART – C					
1	Explain the training methodologies employed in ANN for CAD.	15	CO5	BTL-3	Applying
2	Elaborate the application of Artificial Neural Networks (ANN) as multivariate statistical models with other multivariate statistical approaches.	15	CO5	BTL-4	Analyzing
3	Illustrate the purpose of using Artificial Neural Networks (ANN) for medical image segmentation.	15	CO5	BTL-3	Applying
4	Analyse the factors influencing the choice between ANN and other predictive modeling approaches.	15	CO5	BTL-4	Analyzing
5	Explain how Artificial Neural Networks (ANN) function as optimizers.	15	CO5	BTL-3	Applying