RollNo. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)
B.E. END SEMESTER EXAMINATIONS, DEC 2024

ELECTRONICS AND COMMUNICATION ENGINEERING

EC-5027 Artificial Intelligence and Machine Learning

(Regulation 2019)

Time:3hrs Max.Marks: 100

CO1	To understand problem solving methods and learning design of intelligent systems.
CO2	To understand the concepts of machine learning
CO3	To appreciate supervised and unsupervised learning and their applications
CO4	To build systems those learns and adapt using real-world applications.
CO5	Writing software/project implementations of learning algorithms applied to real-world

BL – Bloom's Taxonomy Levels
(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

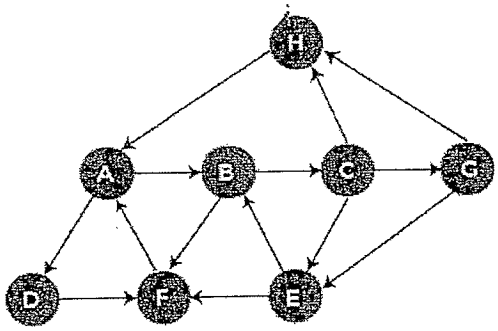
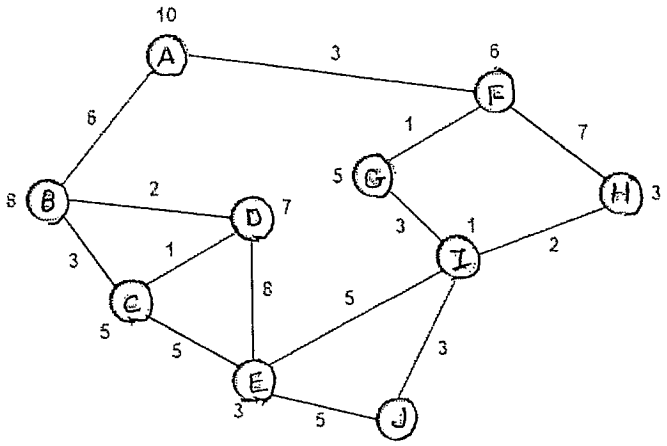
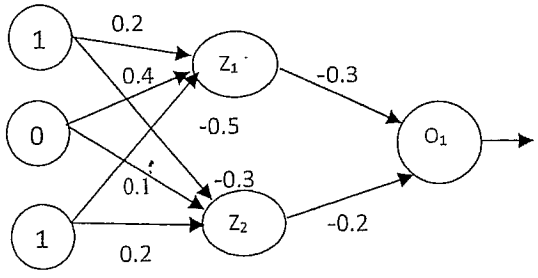
PART- A(10x2=20Marks)
(Answer all Questions)

Q.No	Questions	Marks	CO	BL
1	What are the key elements used in state space representation?	2	1	L1
2	Write the applicability of small talk programming.	2	1	L2
3	Define proportional logic.	2	2	L1
4	Draw the Semantic network for the given state table	2	2	L3
5	Compare supervised and unsupervised learning algorithm.	2	3	L2
6	Write Bayes theorem	2	3	L1
7	What is EM algorithm ?	2	4	L1
8	Distinguish PCA and ICA	2	4	L2
9	Mention the application of logistic regression	2	5	L2
10	List out the role of ML algorithm in CRN	2	5	L2

Present State		Next State				Output	
		$x = 0$		$x = 1$		$x = 0$	$x = 1$
A	B	A	B	A	B	y	y
0	0	0	0	0	1	0	0
0	1	0	0	1	1	1	0
1	0	0	0	1	0	1	0
1	1	0	0	1	0	1	0

PART- B(5x 13= 65Marks)
(Restrict to a maximum of 2 subdivisions)

Q.No	Questions	Marks	CO	BL
11 (a)	Discuss the Computerized reasoning and its methods with suitable example	13	1	L2
	OR			
11 (b)	Describe the way of problem representation to solve the problem in AI with suitable example	13	1	L2

12 (a)	Determine the path among the nodes using the depth first search and breadth first search algorithm for the given diagram with visited nodes representation. Finally, compare which one will be best solution. 	**13**	2	L3
	OR			
12 (b)	Determine the minimum cost path from node A to node J for the given structure using A* algorithm with its forward propagation 	**13**	2	L3
13 (a)	Compute the LDA over the given samples and obtain centroid, co variance matrix, Eigen value and vector. X_1={(4,2), 2.4), (2,3), (3,6) (4,4)} X_2={(9,10), (6,8), (9,5), (3,6) (8,8)}	**13**	3	L4
	OR			
13 (b)	Illustrate one forward propagation and one backward propagation for the following neural network from the given figure. Assume the learning rate is 0.5 and actual output is 1. Use sigmoid activation function for both hidden and output nodes. 	**13**	3	L4
14 (a)	Calculate the centroid value for three iteration from the given points (4,9), (10,12), (7,5), (9,11), (4,6), and (3,10) using K means clustering algorithm with two clusters.	**13**	4	L3

	OR			
14 (b)	Refer the given data to reduce dimension from 2 to 1 using Principal Component Analysis. Elucidate solving the problem in numerically. (4.5,12), (8.5,5), (13.5,6), (7.5,15) and (10, 14)	**13**	4	L3
15 (a)	Explain the Radar working principle and how the AI would have support to improve its performance with suitable algorithm	**13**	5	L4
	OR			
15 (b)	Discuss the traffic predication and classification to provide the good service with suitable algorithm	**13**	5	L4

PART- C(1x 15=15Marks)

(Q.No.16 is compulsory)

Q.No	Questions	Marks	CO	BL
16.	Explain the role of ECG to detect heart disease and how machine learning algorithm supports to early detection and save the life	**15**	5	L5