CLASS: M.Tech   SEMESTER: I
BRANCH: ECE   SESSION: MO-2024

SUBJECT: EC509 ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

TIME: 03 Hours   FULL MARKS: 50

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
4. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates

----

			CO	BL

Q.1(a) Compare between breadth First and Depth First search strategies. Find the shortest path from A to H using A* search. Each edge has an associated weight, and each node has a heuristic cost presented in the table.   [5] CO1 BL4
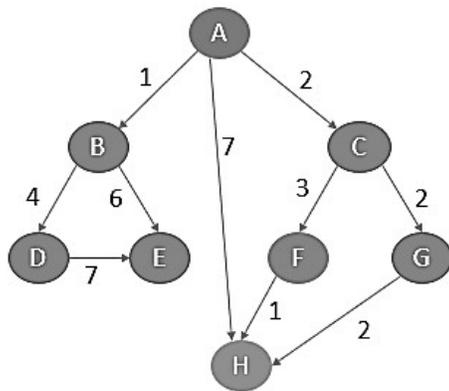
NODES	HEURISTICS
A	5
B	3
C	4
D	2
E	6
F	3
G	1
H	0

Q.1(b) Explain the operation of Genetic algorithm in optimization with a suitable example. Comment on the exploration and exploitation process in genetic algorithm.   [5] CO1 BL2

Q.2(a) Differentiate between linear regression and logistic regression. Discuss the Kruskal-Wallis test with suitable example.   [5] CO2 BL2

Q.2(b) Outline the ANOVA test. In a hospital medicine A and B were tested related to body weight. The first group of 5 patients treated with medicine A is of weight 42,39,38,60 and 41 kgs. The second group of 7 patients from the same hospital treated with medicine B is of weight 38, 42, 56, 64, 68, 69, and 62 kgs. Find whether there is any difference between medicines?   [5] CO2 BL4

Q.3(a) Discuss the different learning strategies of neural network. Describe backpropagation learning of multilayer perceptron network.   [5] CO3 BL3

Q.3(b) Explain the support vector machine and compare with radial basis function network.   [5] CO3 BL3

Q.4(a) Describe in detail the convolutional neural network. How to avoid the overfitting in CNN.   [5] CO4 BL2

Q.4(b) Explain the concept of Autoencoder network. Briefly outline the architecture of LSTM network.   [5] CO4 BL4

Q.5(a) Define classical variable and a fuzzy variable. Show the fuzzification of 45 km/hr speed of the car. Explain various elements of Fuzzy expert system.   [5] CO5 BL3

Q.5(b) Describe the Mamdani Fuzzy inference system with suitable example. State the difference between Mamdani and Sugeno Fuzzy inference System.   [5] CO5 BL3

::::: 25/11/2024 E:::::