

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION MO 2022)**

**CLASS:** M.Tech/PRE-PHD  
**BRANCH:** ECE

**SEMESTER:** I  
**SESSION:** MO-2022

**TIME:** 03 Hours  
**SUBJECT:** EC509 ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

**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

Q.1(a) Compare between informed search and un-informed search strategies.

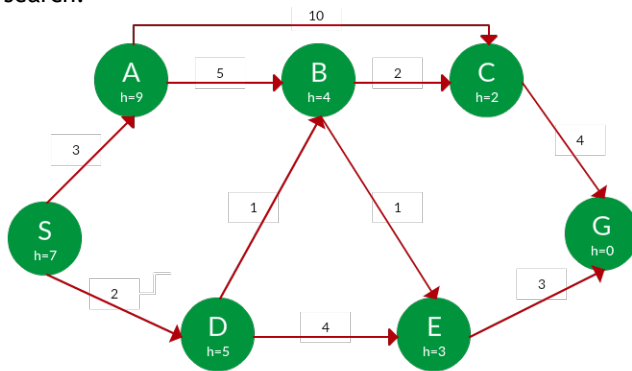
[2] CO1, PO1

Q.1(b) Explain the operation of Genetic algorithm in optimization.

[3] CO1, PO1, PO3

Q.1(c) Describe Breadth first search algorithm. Find the path to reach from S to G using A\* search.

[5]  
CO1; PO2, PO3



Q.2(a) Define regression. Differentiate between linear regression and logistic regression.

[2] CO2, PO1

Q.2(b) What is parametric statistical test. Describe the ANOVA test.

[3] CO2, PO3

Q.2(c) Explain Kruskal-Wallis test with suitable example.

[5] CO2, PO3

Q.3(a) Compare the different learning strategies of neural network.

[2]  
CO1; CO3, PO5

Q.3(b) Explain the k-means clustering with its applications.

[3]  
CO3; PO3, PO4

Q.3(c) Describe multilayer perceptron network and the backpropagation learning.

[5]  
CO1, CO3; PO3

Q.4(a) State the deep learning concept.

[2] CO4; PO2

Q.4(b) Outline the concept of Autoencoder network.

[3] CO4, PO4

Q.4(c) Describe the convolutional neural network.

[5] CO4, PO4

Q.5(a) Compare Fuzzy logic with crisp logic with example. Explain various elements of Fuzzy expert system.

[5]  
CO5; PO3, PO6

Q.5(c) Describe the Mamdani Fuzzy inference system with suitable example.

[5]  
CO5; PO3, PO6