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B127472(022)

B. Tech. (Hon's) (Fourth Semester) Examination, April-May 2023

(New Scheme)

(Inf. & Tech. Engg. Branch)

ARTIFICIAL INTELLIGENCE : PRINCIPLES and APPLICATION

Time Allowed : Three hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note *: Part (a) of each question is compulsory & carries 4 marks. Attempt any* ***two*** *parts from (b), (c) and (d) of each question and each part carries 8 marks.*

Unit-I

1. (a) Define Turing test with suitable example.

   (b) Solve Water Jug Problems using production rules with state space concept.

   (c) What is Search? Explain DFS and BFS with proper

algorithms and examples.

(d) What is Heuristic Function? Solve A* problem with proper algorithm and example.

Unit-II

2. (a) What is Predicates? Explain it with example.

(b) Explain constraint satisfaction. Solve the following:

$$\begin{array}{r} S\ E\ N\ D \\ +\ M\ O\ R\ E \\ \hline M\ O\ N\ E\ Y \end{array}$$

(c) Explain Alpha and Beta cut off with proper example and algorithm.

(d) What is first order predicate logic (FOPL)? Convert the following in FOPL.

(i) Everyone is loyal to someone

(ii) All mangoes are sweet

(iii) All employees of software company are programmers

(iv) All purple mushrooms are poisonous

Unit-III

3. (a) Define probilistic Reasoning.

(b) Explain Bayes' theorem with suitable example.

(c) Explain Hidden Morkov Model with proper example.

(d) Explain Fuzzy set theory with suitable example.

Unit-IV

4. (a) What is Machine Learning?

(b) Differentiate between Supervised and Unsupervised learning.

(c) Explain K-Means Clustering.

(d) Explain Decision trees : Multivariate trees.

Unit-V

5. (a) What are the different data visualization tools available? Is MS-Excel data visualization tool?

(b) Explain Data Visualization? Explain different graphs used in data visualization.

(c) How do you calculate over fitting and under fitting functions?

(d) Why do we need Box Fitting Graph? Explain with proper graph and example.