

Exam.Code:0917
Sub. Code: 6788

2021
B.E. (Computer Science and Engineering)
Fifth Semester
CS-503: Artificial Intelligence

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Briefly explain the following:-

- a) Heuristic search
- b) Knowledge representation
- c) Forward vs Backward reasoning
- d) Intelligent agent
- e) Non-monotonic expert system (5x2)

UNIT – I

II. a) Differentiate between Intelligence and Artificial Intelligence giving suitable example(s) to support your answer.

b) Suppose you have three jugs measuring 12 gallons, 8 gallons, 3 gallons and a water tap. You can fill the jugs up or empty them out from one to another or onto the ground. Your objective is to measure out exactly one gallon. Give the complete state space and set of all applicable rules. (2x5)

III. a) What do you mean by Hill Climbing? Explain.

b) A monkey is in a room containing a box and a bunch of bananas. The bananas are hanging from the ceiling out of reach of the monkey. What sequence of actions will allow the monkey to get the bananas? The monkey knows how to move around, carry other things, reach to bananas and wave the stick in the air. Use means-ends analysis to solve this problem. (2x5)

IV. a) If a problem-solving search program were to be written to solve each of the following types of problems, determine whether the search should proceed forward or backward. Justify your answer:

- i) Water jug problem
- ii) Blocks world
- iii) Natural language understanding (3x2)

P.T.O.

(2)

- b) Briefly explain the Miniskey Frames. What are the advantages of a frame based knowledge representation? (4)

UNIT – II

- V. a) Explain briefly the concept of the Dempster-Shafer theory. (3)
- b) Define a Fuzzy set. What is the significance of Fuzzy logic technique? (3)
- c) Consider the following set of propositions:
Patient has spots
Patient has measles
Patient has high fever
Patient has previously been vaccinated against measles
Patient was recently bitten by a tick
Patient has an allergy
- d) Create a network that defines the causal connections among these nodes. Make it a Bayesian network by constructing the necessary conditional probability matrix. (4)
- VI. Define an Expert System giving a suitable example. Briefly discuss the architecture of a rule-based expert system and a decision tree-based expert system. State the demerits of an expert system. (10)
- VII. a) Discuss the Hierarchical planning approach in detail giving a suitable example.
- b) What are Intelligent Agents? Discuss the different types of Intelligent Agents in detail. (2x5)