

BACHELOR OF TECHNOLOGY (C.B.C.S.) (2020 COURSE)
 B.Tech.Sem - V Computer Science & Engineering : WINTER- 2022
 SUBJECT : ITC-III: ARTIFICIAL INTELLIGENCE

Day : Friday

Time : 02:30 PM-05:30 PM

Date : 16-12-2022

W-24319-2022

Max. Marks : 60

N.B. :

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Use of **CALCULATOR** is allowed.
- 4) Draw neat and labeled diagrams **WHEREVER** necessary.

- Q.1** Define PEAS in detail. Also represent following terms in PEAS format (10)
- i) Automated taxi driver
 - ii) Vacuum cleaner
 - iii) Refinery controller
 - iv) Soccer player Robot

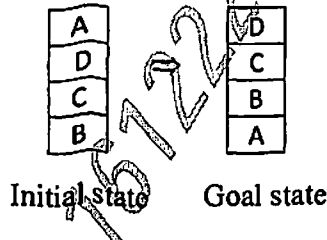
OR

List types of agents. Also explain in detail types of agents. (10)

- Q.2** Define state space search. Solve water jug problem using production rule. We use two jugs called four and three four holds a minimum of four gallons of water and three holds a minimum of three gallon of water. How can we get two gallon of water in the four jug? (10)

OR

Discuss concept of hill climbing search algorithm. Solve below example using hill climbing algorithm. (10)



- Q.3** Define constraint satisfaction problem. List constraints of cryptarithmic addition and solve below problem using crypt arithmetic addition. (10)
- | | |
|-------------------------------------|-------------------------------------|
| i) SEND
+ MORE

MONEY | ii) YOUR
+ YOU

HEART |
|-------------------------------------|-------------------------------------|

OR

Describe min-max algorithm with suitable example in AI. (10)

- Q.4** Write Rules for introduction and elimination of ' \rightarrow ' also prove below examples using natural deduction rules. (10)
- a) $p \vee q \vdash \neg p \rightarrow q$
 - b) $\neg p \rightarrow q \vdash p \vee q$
 - c) $\neg(p \rightarrow q) \vdash p \wedge \neg q$
 - d) $(p \rightarrow q) \rightarrow q \vdash (q \rightarrow p) \rightarrow p$

OR

In this question use will use the following sentences. To answer a question use backward chaining algorithm (10)

- i) Horses, cows and pigs are mammals
- ii) An offspring of a horse is a horse
- iii) Bluebeard is a horse
- iv) Bluebeard is Charlies parent
- v) Offspring and parent are inverse relations
- vi) Every mammal has parent

Q.5 Describe Demster Shafer theory. Also solve below example. Use Demster Shafer theory to find out the measure of belief m_3 given that $m_1 = \{\text{abbot, babbot}\} = 0.8, \theta = 0.2, m_2 = \{\text{abbot, cabbot}\} = 0.7, \theta = 0.3.$ (10)

OR

Measure of belief for particular hypothesis h_1 in presence of evidence of e_1 is 0.3, h_1 in presence of evidence of e_2 is 0.4, h_1 in presence of evidence e_3 is 0.7 and M. B. for particular hypothesis h_2 in presence of evidence e_1 is 0.4, e_3 is 0.2, calculate C. F. (10)

$(h_1 \wedge h_2, e_1 \wedge e_2 \wedge e_3)$

Q.6 Explain Architecture of Expert system? Give its application area. (10)

OR

List expert system examples? Discuss in detail expert system shell. (10)

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