B.Tech. Sem. V (2020 course) computer science & Engg.
Winter. 2022

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)**

Initial state Goal state

Q.3 Define constraint satisfaction problem. List constraints of cryptarithmatic 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

P.T.O.

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 belif m3 given that ml = {abbot, babbot} = 0.8, θ=0.2, m2 = {abbot, cabbot}=0.7, θ=0.3. **(10)**

OR

Measure of belif for particular hypothesis h1 in presence of evidence of e1 is 0.3, h1 in presence of evidence of e2 is 0.4, h1 in presence of evidence e3 is 0.7 and M. B. for particular hypothesis h2 in presence of evidence e1 is 0.4, e3 is 0.2, calculate C. F. **(10)**
$(h1 \wedge h2,\ e1 \wedge e2 \wedge e3)$

Q.6 Explain Architecture of Expert system? Give its 3 application area. **(10)**

OR

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

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