Total No. of Questions : 12]

SEAT No. :

P1413

[Total No. of Pages : 3

[4759]-129
B.E. (Electronics)
ARTIFICIAL INTELLIGENCE
(2008Course) (Elective-IV) (Semester-II)

Time : 3 Hours] *[Max. Marks : 100*

Instructions to the candidates:

1) ***Answers to the two sections should be written in separate answer books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Use of Calculator is allowed.***
5) ***Assume Suitable data if necessary***

SECTION-I

Q1) a) Explain what role does PEAS (performance, Environment, Actuators,Sensors) has in AI. What are the PEAS for: **[12]**

i) Vaccum cleaner world.

ii) Automated taxi

iii) Virtual Internet

b) With a suitable example, differentiate agent, agent function and agent program. **[6]**

OR

Q2) a) What are the different kinds of agent programs that embody the principles of AI systems? Explain base line difference between then and explain any one of them in detail. **[10]**

b) With algorithmic steps, explain how depth limited search algorithm is a good combination of breadth first and depth first algorithm? **[8]**

Q3) a) What are different Heuristic search strategies,Explain A* search in detail. **[10]**

b) Explain the mathematics of constrained satisfaction problems. **[6]**

OR

Q4) a) Explain hill - climbing search algorithm for 8-queens state Problem.Why is Hill climbing sometimes called as greedy local search. **[8]**

b) How is evaluation function a best combination of minimax algo. and alpha-beta algorithm? How evaluation function is mathematically represented? **[8]**

P.T.O.

Q5) a) Explain the similarities and differences involved in first order logic and propositional logic. **[4]**

b) I want to state that everyone in US is smart. Which of these two statements is wrong and why?

- $\forall x\, At(x, US) \Rightarrow Smart(x)$
- $\forall x At(x, US) \wedge Smart(x)$ **[4]**

c) Use a diagram to show the different parts of a learning agent,explain the importance of problem generator on that. **[8]**

OR

Q6) a) Represent in logical language representation: **[8]**

- Some lions roar.
- All lions have 4 legs.
- No lion bray.

b) Describe inductive learning and state why it is inadequate for use wth AI systems. How the degree of polynomial matters in case of hypothesis? **[8]**

SECTION II

Q7) a) Explain the role of Neural Network in learning.In relation to multi layer networks mention the weight update equation. **[8]**

b) Explain the mathematics and concepts of EM (expectation-maximization)algorithm. **[10]**

OR

Q8) a) Describe inductive learning and state why it is inadequate for use with AI systems. **[6]**

b) Explain the concept of knowledge in learning. **[6]**

c) Use a diagram to show the different parts of a learning agent. **[6]**

Q9) a) Discuss Expert System Architecture with suitable example. **[8]**

b) Explain waltz algorithm with example and comment on its limitations. **[8]**

OR

Q10)a) Draw a neat diagram of an expert system and explain the functioning of the major components. **[8]**

b) Write a short note on the shell and knowledge base of an expert system. **[8]**

Q11)a) Differentiate between. **[12]**

- Natural Language Processing(NLP) and Natural Language Generation. (NLG)
- Syntax, semantics and pragmatics.
- lexical ambiguity and syntactic ambiguity.

b) Draw the parse tree with semantic interpretations for the string

"7+(8÷4)". **[4]**

OR

Q12)a) With suitable examples explain in short: Lexicon of ε_0 and Grammar of ε_0. **[8]**

b) With relevant mathematics,explain Probabilistic language models. **[8]**