

C 60582

(Pages : 3)



**EIGHTH SEMESTER B.TECH. (ENGINEERING) DEGREE**  
**EXAMINATION, APRIL 2014**

**INTELLIGENT COMPUTING**

Time : Three Hours

**Part A**

**All questions are compulsory.**

*Each question carries 2 marks.*

1. Consider a vocabulary with only three propositions, A, B and C. How many models are there for the following sentence ?

$$(A \wedge B) \vee (B \wedge C).$$

2. Suppose a knowledge base contains just one sentence, for all  $x$   $\text{AsHighAs}(x, \text{Everest})$ . Which of the following are legitimate results of applying Existential Instantiation ?

(a)  $\text{AsHighAs}(\text{Everest}, \text{Everest})$

(b)  $\text{AsHighAs}(\text{Kilimanjaro}, \text{Everest})$

(c)  $\text{AsHighAs}(\text{Kilimanjaro}, \text{Everest}) \wedge \text{AsHighAs}(\text{BenNevis}, \text{Everest})$

3. Why can't conditional planning deal with unbounded indeterminacy ?
4. List out the complexities of exact inference.
5. Mention different forms of machine learning.

(5 × 2 = 10 marks)

**Part B**

*Answer any four questions.*

*Each question carries 5 marks.*

6. Both performance measure and the utility function measure how well an agent is doing ? Explain the difference between the two.
7. Decide whether each of the following sentences is valid, unsatisfiable or neither.

(a)  $\text{Smoke} \Rightarrow \text{Fire}$ .

(b)  $(\text{Smoke} \Rightarrow \text{Fire}) \Rightarrow (\neg \text{Smoke} \Rightarrow \neg \text{Fire})$ .

**Turn over**

8. Write about redundant inference and infinite loops in prolog with suitable examples.
9. Prove the following assertions about planning graphs :
  - (a) A literal that does not appear in the final level of the graph cannot be achieved.
  - (b) The level cost of a literal in a serial graph is no greater than the actual cost of an optimal plan for achieving it.
10. After your yearly checkup, the doctor has bad news and good news. The bad news is that you tested positive for a serious disease and that the test is 99% accurate. The good news is that this is a rare disease, striking only 1 in 10,000 people of your age. Why is it good news that the disease is rare? What are the chances that you actually have the disease ?
11. Discuss about units in neural networks.

(4 × 5 = 20 marks)

### Part C

*Answer all questions.*

*Each question carries 10 marks.*

12. (a) List out the basic kinds of agent program that embody the principles underlying almost all intelligent systems. Explain any *two* in detail.

*Or*

- (b) Consider a state space where the start state is number 1 and the successor function for state  $n$  returns two states, numbers  $2n$  and  $2n+1$ .
  - (i) Draw the portion of the state space for states 1 to 15.
  - (ii) Suppose the goal state is 11. List the order in which nodes will be visited for breadth-first search, depth-limited search with limit 3 and iterative deepening search.
13. (a) Discuss in detail about efficient forward chaining and incremental forward chaining logic inference algorithms with necessary examples.

*Or*

- (b) Write about reasoning with default information.

14. (a) Explain about scheduling with resource constraints.

*Or*

(b) Describe axioms of probability.

15. (a) Describe single layer feed-forward neural networks and multi layer feed-forward neural networks.

*Or*

(b) Mention the uncertainty in robotics problems. Explain.

(4 × 10 = 40 marks)