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**University Examinations 2014/2015**

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE INFORMATION TECHNOLOGY AND BACHELOR OF MATHEMATICS AND COMPUTER SCIENCE

**CCS 3375: ARTIFICIAL INTELLIGENCE**

 **DATE: APRIL 2015 TIME: 2 HOURS**

**INSTRUCTIONS:** *Answer question* ***one*** *and any other* ***two*** *questions*

**QUESTION ONE (30 MARKS)**

1. Discuss the Turing Test approach (2 Marks)
2. Define the term artificial intelligence (2 Marks)
3. Differentiate between: (4 Marks)
4. Goal-based agents and utility-based agents
5. Prepositional versus first order logic
6. Enumerate and discuss any three uninformed search methods (6 Marks)
7. State and explain Baye’s rule (4 Marks)
8. Interpret the following first-order logic: (4 Marks)
9. 
10. 
11. Explain the following: (8 Marks)
12. Neural networks
13. Fuzzy logic
14. Knowledge based systems
15. Case based reasoning

**QUESTION TWO (20 MARKS)**

1. Discuss the agent execution cycle phases (4 Marks)
2. In a table format give any five comparison of STRIPS and ADL languages for representing planning problem (5 Marks)
3. Describe the following: (6 Marks)
4. A\*search
5. Supervised learning
6. Reinforced learning
7. Explain the concept of Hidden Markov Model using your own application example

(5 Marks)

**QUESTION THREE (20 MARKS)**

1. List and explain any four properties of an agent (4 Marks)
2. A problem in A1 can be defined formally by five components. List and explain (5 Marks)
3. Illustrate and discuss components of Knowledge Based Systems architecture (3 Marks)
4. Write short notes on the following: (8 Marks)
5. Reasoning under uncertainty
6. Abduction
7. Learning by induction
8. Heuristic planning

**QUESTION FOUR (20 MARKS)**

1. Explain any three differences between the concept of Agent and Object (6 Marks)
2. Discuss active and passive reinforcement learning with suitable example (4 Marks)
3. Explain the concept of planning with state space search using example (4 Marks)
4. Explain the main components of an Expert system (4 Marks)
5. Differentiate between Forward and Backward Chaining (2 Marks)

**QUESTION FIVE (20 MARKS)**

1. Describe the differences and similarities between problem solving and planning (4 Marks)
2. Explain the concept of Bayesian Network (4 Marks)
3. Define the term action schema as used in planning (2 Marks)
4. In general, an action schema consists of three parts. List and explain using your own example (6 Marks)
5. Describe the architecture of Expert System (4 Marks)