**UNIVERSITY EXAMINATIONS 2013/2014**

FOURTH YEAR, FIRST SEMESTER EXAMINATION FOR DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE

**ICS 2405: KNOWLEDGE BASED SYSTEMS**

**DATE:APRIL 2014 TIME:2 HOURS**

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

**Question one-(30 marks**

1. Several strategies may be used to choose the rules to fire from the conflict set: discuuss these strategies (5 marks)
2. Describe the archtechture of a typical rule based expert system (6 marks)
3. Discuss four benefits of expert systems (4 marks)
4. Discuss the following uninformed search methods(blind) Depth – first search (2 marks) Iterative deepening search (2 marks) Bi-directional search (2 marks)
5. Explain the following terms as used in artificial intelligence. Intelligence (1 mark) initial state (1 mark) successor function (1 mark) path cost (1 mark)
6. Distinguish between data-directed and goal-directed analysis in rule-based systems. Which is preferred for medical diagnostic systems and why? (5 marks)

**Question two-(20 marks)**

1. A knowledge based systems (kbss) are developed to deal with particular application domain in which alternative techniques are unable to produce reliable and manageable solutions. Identify and discuss five aspects of human intelligence that could be used to characterize intelligent knowledge-based systems (10 marks)
2. List the persons who determine the success of expert system and development (4 marks)
3. Discuss how they can guarantee the failure of expert systems project (6 marks)

**Question three-(20 marks**

a) Use A\*algorithm to find the path from city S to city G by using the following functions. (10 marks) [8.5] 4 [6] 4 [3]

 3 5 5

[10]

 4 2 4 3 . [8] [6] [3]

b) Discuss any two applications of search methods (2marks)

c) It is argued that semantic network representation is closer to the way humans structure knowledge by building mental links between things than the predicate logic. Use the information below to create a semantic network. (8 marks) Tom is a cat Tom caught a bird Tom is owned by John Tom is ginger in colour Cats like cream The cat sat on the mat A cat is a mammal A bird is an animal All mammals are animals Mammals have fur

**Question four-(20 marks)**

1. Using a suitable example show how backward chaining and forward chaining algorithm works? (10 marks)
2. Using suitable examples discuss the following knowledge representation schemes. i.Frames (5 marks) ii.production rules (5 marks)

**Question five-( 20 marks)**

1. Reasoning is the process of drawing inferences or conclusions; moving from what is known (fact) to what is unknown (inference). Discuss ant four types of reasoning. (8 marks)
2. Giving examples, Briefly describe the following terms as used in prolog. i.Atom (1 mark) ii.variables (1 mark) iii.compound terms (1 mark)
3. Discuss any five ways in which agent is different from other software (5 marks)
4. What is search (2 marks)
5. Write the following using wff. ‘’ít is raining today so i will not go to work.’’ (2 marks)