ICS 2405 Knowledge Based Systems

knowledge based systems (Jomo Kenyatta University of Agriculture and Technology)

W1-2-60-1-6

JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS 2018/2019
YEAR 4 SEMESTER 1 SPECIAL/SUPPLEMENTARY EXAMINATIONS FOR THE DEGREE OF BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

ICS 2405: KNOWLEDGE BASED SYSTEMS

DATE: MARCH 2019 **TIME: 2 HOURS**

INSTRUCTIONS: ATTEMPT QUESTION ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE

a) Define the following terms (3 marks)

i) Knowledge
ii) Case based Reasoning
iii) Symbolic Reasoning

b) Differentiate between breadth first search and depth first search (2 marks)

c) Discuss how reasoning is done using:

i) Backward chaining (2 marks)
ii) Forward chaining (2 marks)

d) How does propositional logic work (3 marks)

e) Discuss knowledge representation under

i) Lists (2 marks)
ii) Decision Trees (2 marks)

f) Knowledge bases form the basis of artificial intelligent systems. Explain why this statement is true. (4 marks)

g) Consider the set of rules given below. Assuming that the goal is F, use BOTH Forward Chaining and Backward chaining to prove whether F is true or not. Given facts are: A, B and E. explain every step taken. (10 marks)

If E then B
If B Or E then C
If A and C then D
If D and A then H
If H and D then F

QUESTION TWO (20 MARKS)

a) Write each of the following in well-formed formulas (6 marks)

i) Everybody loves someone
ii) Jane loves food
iii) A day is either cold or hot

b) In which reasoning circumstances would each of the following be applicable (4 marks)

i) Inductive Reasoning
ii) Deductive Reasoning

c) Describe Case Based Reasoning by providing a clear example (4 marks)

d) Identify and explain three ways in which case based reasoning is different from other Artificial Intelligence approaches. (6 marks)

QUESTION THREE (20 MARKS)

a) Discuss the following reasoning types (8 marks)

i) Reasoning from signs
ii) Cause and effect
iii) Reasoning by analogy
iv) Reasoning by Example

b) Describe the principle of Modus Ponens and Modus Tollens (4 marks)

c) How was Turing Test of intelligence used in Intelligence Test (4 marks)

d) Explain two challenges associated with knowledge representation and describe what needs to be done to handle such challenges (4 marks)

QUESTION FOUR (20 MARKS)

a) Briefly explain the following terms:

i) Knowledge
ii) Atomic sentence (4 marks)

bi) Write a logical expression that describes the following sentence: *If I pass the exam and I pass the course work then I will pass the course or the marking system is faulty*. State the meaning of any terminology you introduce. (2 marks)

ii) Build the truth table for the expression (4 marks)

c) Explain what is meant by conflict resolution and describe any two strategies for dealing with it.

d) Briefly, explain any four characteristics of knowledge Base systems (6 marks)

e) Questioning is a knowledge acquisition method that involves the knowledge engineer interviewing the expert in a series of meetings, or asks the expert to fill out a questionnaire. Briefly explain the two strategies used in questioning the expert (4 marks)