

**W1-2-60-1-6**

## JOMO KENYATTA UNIVERSITY

**OF**

**AGRICULTURE AND TECHNOLOGY**

# University Examinations 2014/2015

**SPECIAL/ SUPPLEMENTARY YEAR IV SEMESTER II EXAMINATION FOR THE DEGREE OF BACHELOR OF BUSINESS INFORMATION TECHNOLOGY/YEAR III SEMESTER II BACHELOR OF SUPPLYS CHAIN MANAGEMENT**

**BRT 2209/ BIT 2319: INTRODUCTION TO ARTIFICIAL INTELLIGENCE**

**DATE: JULY 2015 TIME: 2 HOURS**

**INSTRUCTIONS: ANSWER QUESTION ONE (COMPULSORY) AND**

**ANY OTHER TWO QUESTIONS.**

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**QUESTION ONE (30 MARKS)**

(a) Give the difference between forward and backward chaining. As you explain give any example of each method using a new example.(10 marks)

(b) i) What is the Turing test and what is ti supposed to prove.(4 marks)

ii) Discuss any three properties a computer should possess to pass the Turing test. (6 marks)

(c) Describe the term complete and optimal with regards to evaluating search strategies. Are either BFs and DFs complete? Is either of them optimal discuss. (4 marks)

(d) Discuss the fundamentals difference between an informed search algorithm and uninformed one? (2 marks)

(e) Describe briefly the four basic components of a learning Artificial Agent and their roles.

(6 marks)

**QUESTION TWO (20 MARKS)**

(a) Demonstrate how Search First Search and Depth First Search can be implemented using some appropriate pseudo-code. (10 marks)

(b) Analyse the worst case time and space compelexity of the two algorithms in question (a) above. (4 marks)

( c) The following tree is a search tree for some state space. Arc denote costs, double circles, indicates goal nodes.

Indicate the order in which nodes will be chosen and expanded upto the first goal node using.

i) Depth First Search (2 marks)

ii) Iterative deepening search (2 marks)

iii) Has the costs associated with the arcs influenced

the above expansity. (2 marks)

**QUESTION THREE (20 MARKS)**

(a) What is knowledge acquisition. (2 marks)

(b) Describe the knowledge acquisition process. (8 marks)

(c) Discuss why rule induction and protocol analysis, knowledge elicitation techniques are different. (3 marks)

(d) Stat one problem with knowledge acquisition. (1 mark)

(e) State two conditions that must hold for an export systems implementation project to succeed. (2 marks)

(f) Demonstrate your understanding on the significance of Artifical Intelligence as an enabler to the realization of the government of Kenya Vision 2050 Millenium Goals. (6 marks)

**QUESTION FOUR (20 MARKS)**

(a) Translate into predicate logic (4 marks)

i) All birds that are not Penguins

ii) Every child has exactly two parents

(b) Construct a semantic network to represent the following information:

Falcons and Eagles are birds. All birds have wings and beak. In particular eagles have light feathers and long beaks. Birds fly and use aerodynamic principles. Gliding is a principle used by eagles. Planes also fly have wings and use aerodynamic principles. A plane has an engine and a pilot. An engine uses petrol. A Boeing 747 is a plane. (6 marks)

(c) Alice, Bob, Camilla and Dan are making plans for Holiday. They go to the travel agency but there are only 2 tickets left. Alice will only go if Bob goes too. Dan will go if Camilla goes too. Bob has found out that he has work on the Artificial Intelligence project so he can not go.

i) Write propositional logic formulars corresponding to

this text. (5 marks)

ii) Alice will go only if Bob goes. (2 marks)

iii) Dan goes only if Camila goes (2 marks)

iv) Bob cannot go (1 mark)

**QUESTION FIVE (20 MARKS)**

(a) At the top of the building there are there couples (husband and wife) The stairway is not accessible the building can only be evacuated through the elevator. The elevator can only carry up to three persons and has to be operated by at least one person. Husbands do not accept that their wives go in the elevator with other men, if they are nor present. How can the building be evacuated without provoking jealousy crisis? Formulate the problem as a search problem.

i) Describe the states the initial state and the final state.(3 marks)

ii) Describe the operators and the conditions for their

applicability. (3 marks)

iii) Describe the states that can be reached form the initial state by means of a sing application of an operator. (4 marks)

iv) Show a solution path and the operators used to generate it.(3 marks)

(b) Discuss giving examples the four views of Artificial Intelligence.(4 marks)

(c) What is the difference betweens searching algorithm and

a planning algorithm. (3 marks)

(d)