Kirinyaga University

UNIVERSITY EXAMINATION 2018/2019

YEAR III SUPPLEMENTARY/SPECIAL EXAMINATION FOR THE DEGREE OF BSC IN INFORMATION TECHNOLOGY

YEAR IV SUPPLEMENTARY/SPECIAL EXAMINATION FOR THE DEGREE OF BSC IN MATHEMATICS AND COMPUTER SCIENCE

BIT 2319 ICS 2308 - Artificial Intelligence Year Iii 2019

Date: Wednesday, 10th July 2019 **Time**: 1.30pm – 3.30pm

INSTRUCTIONS

*Answer Question One and any other **two** questions*

QUESTION ONE

a) Outline the Turing Test for intelligence (4 marks)

b) Explain the meaning of the following terms

(i) Intelligence

(ii) Knowledge

(iii) Knowledge elicitation (6 marks)

c) Explain the structure and the working of a human neuron (5 marks)

d) Explain three key features of PROLOG as a knowledge representation language (6 marks)

e) (i) Explain the role of logic in artificial intelligence (2 marks)

(ii) State the advantage and the disadvantage of using logic (4 marks)

f) Explain how studies in social systems have influenced the advancements in artificial intelligence (3 marks)

QUESTION TWO

a) Using an example, explain how research in the following areas contributed to the birth of artificial intelligence (6 marks)

(i) Philosophy

(ii) Psychology

(iii) Cognitive science

b) (i) State the meaning of a heuristic function (2 marks)

(ii) Explain the nature of a heuristic function in a search problem (4 marks)

c) Distinguish between shallow and deep reasoning (4 marks)

d) Explain the importance of unification in reasoning systems (4 marks)

QUESTION THREE

a) Explain the nature of reasoning in the following cases (3 marks)

(i) intuition

(ii) nonmonotonic reasoning

(iii) autoepistemic

b) Using a relevant citation, explain the backward chaining technique in rule induction (4 marks)

c) Explain three disadvantages of semantic networks (6 marks)

d) (i) Explain the meaning of conflict resolution (2 marks)

(ii) Highlight five techniques used in conflict resolution (5 marks)

QUESTION FOUR

a) Explain the following components of logic based knowledge representation (4 marks)

(i) Constants

(ii) Predicates

(iii)Functions

(iv)Variables

(v) Quantifiers

b) Define the following terms as used in inference strategies

(i) Inference

(ii) Backward chaining

(iii) Forward chaining (6 marks)

c) Develop a semantic network for the following knowledge

mother(john,sue)

father(john,max)

age(john,5)

wife(sue,max)

age(max,34) (5 marks)

d) Outline any five machine learning techniques (5 marks)

QUESTION FIVE

a) Explain the following views of artificial intelligence
   (i) Systems that think like humans
   (ii) Systems that think rationally (4 marks)

b) Outline the algorithm for a table driven agent (5 marks)

c) Explain the Three principles for a knowledge representation language (6 marks)

d) Describe the travelling salesman problem and state why it is considered as an NP-hard class of problem (5 marks)