TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN:
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
BACHELOR OF MATHEMATICS & COMPUTER SCIENCE
(BSTI 11M, BMCS 12S)

BIT 2319: ARTIFICIAL INTELLIGENCE

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2014
TIME: 2 HOURS

<u>**Instructions to Candidates:**</u>
You should have the following for this examination
- *Answer Booklet*

This paper consists of **FIVE** questions. Attempt question **ONE (Compulsory)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (Compulsory)

a) Demonstrate your understanding on any FIVE different roles of Intelligent Agents in Business and information infrastructure   **(10 marks)**

b) With a suitable example differentiate between forward chaining and backward chining rule based inference control   **(8 marks)**

c) Define the term knowledge representation and show how rules qualify to be a knowledge representation formalism. Discuss ONE advantages of using rules as a representation formalism.
                                (8 marks)

d) Discuss using your own words your understanding of the term pattern recognition, give any TWO practical applications. **(4 marks)**

Question Two

a) What is knowledge acquisition? **(2 marks)**

b) Describe the knowledge acquisition process. **(3 marks)**

c) State ONE problem with knowledge acquisition **(2 marks)**

d) Use examples to describe the forward chaining and backward chaining inference control mechanism. **(6 marks)**

e) Use an outline diagram to describe the structure of the main parts of an expert system **(5 marks)**

f) State TWO conditions that must hold for an expert systems implementation project to succeed. **(2 marks)**

Question Three

a) Discuss why agents in Artificial Intelligence need not only be software entities. **(2 marks)**

b) Describe any FOUR characteristics of intelligent agents **(2 marks)**

c) Describe statistical classification techniques **(2 marks)**

d) Suppose you have the following search space:

State	Next	Cast
A	B	4
A	C	1
B	D	3
B	E	8
C	C	0
C	D	2
C	F	6
D	C	2
D	E	4
E	G	2
F	G	8

    (i) Draw the state space of this problem **(4 marks)**
    (ii) Show at each step what nodes are in the queue for the Breath-First-Search. Show the list of nodes that are expanded. Required use a table for analysis. **(6 marks)**
    (iii) What is the Worst-Case Time and space complexity of the above algorithm? **(4 marks)**

Question Four

a) Clearly explain the FOUR views of AI **(8 marks)**

b) Give short notes on the following AI aspects:
    (i) Natural Language processing
    (ii) Neural network   **(4 marks)**

c) Why is it better to design performance measures for an agent according to effects in the environment instead of behaviors of the agent?   **(2 marks)**

d) With reference to A.I explain the Turing Test   **(4 marks)**

e) Discuss any TWO disadvantages that may arise with the implementation of intelligent agent technology.   **(2 marks)**

Question Five

a) Describe what is meant by the following search strategies giving the properties of each, state the most optimal in run time:
    (i) State-space search
    (ii) Breadth first search
    (iii) Breadth first search   **(12 marks)**

b) Give any TWO real life examples of a search problem   **(2 marks)**

c) List and explain any FOUR characteristic used to evaluate a search state strategy   **(8 marks)**