TECHNICAL UNIVERSITY OF MOMBASA

Institute of Computing & Informatics

UNIVERSITY EXAMINATION FOR:

BSIT/SEP 2012/J-FT Y4S2

BIT 2319 ARTICIAL INTELLIGENCE **Paper 2**

END OF SEMESTER EXAMINATION

SERIES: APRIL 2016

TIME: 2 HOURS

Instructions to Candidates

You should have the following for this examination
-Answer Booklet, examination pass and student ID
This paper consists of Five questions. Attempt Question One and any two other
Do not write on the question paper.

Question ONE

a) Discuss any four critical success factors for the successful implementation of expert systems (4marks)

b) Demonstrate your understanding on the significance of A.I as an enabler to the realization of the Government of Kenya Vision 2030 millennium goals. (8 mark)

(c) With a suitable example differentiate between forward chaining and backward chaining rule based inference control. (6marks)-

(d) Define the term knowledge representation and show how rules qualify to be a knowledge representation formalism. Discuss one advantage of using rules as a representation formalism. (6 marks)

f) i) Discuss the term pattern recognition [2marks]

ii) Drug trafficking is a worldwide problem. Lately, Kenya has been described to be hub for this activity. Hard drug users in Mombasa are also said to be on the increase. Imagine you are a drug enforcement officer at the Moi international Airport. Describe how you would apply pattern recognition in your professional work. (4 marks)

Question TWO

(a) Discuss any two reasons why psychology may be regarded as a foundation of Artificial Intelligence. State two other foundations of Artificial Intelligence. (4 marks)

(b) (i) Discuss one advantage and one disadvantage of exhaustive search as a problem solving technique. (2 marks)

(ii) Show how a search problem may be specified. (3 marks)

(iii) Describe the best-first search. Explain why you would recommend such a search method. (4 marks)

(iv) State any two real life applications of the search technique. (2 marks)

(c) Describe predicate calculus as knowledge representation formalisms. State one advantage and one limitation of the knowledge representation formalism. (5 marks)

Question THREE

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

(b) You have been selected to be part of a team that is assigned the task of developing a knowledge based system. Describe the phases your team must undertake in the process of acquiring knowledge for your system. (10 marks)

(c) Use an outline diagram to describe the structure of the main parts of an expert system. (8 marks)

Question FOUR

(a) Discuss why agents in Artificial Intelligence need not only be software entities. (3 marks)

(b) Describe statistical classification technique. (2 marks)

c) Translate the following into predicate calculus (first order logic) using the predicates provided. (5 marks each)

"Every person is loved by some other person"
Predicates: Person(x) loves(x,y)

d) List and explain any four characteristics used to evaluate a search state strategy (8marks)

e) What is a heuristic function in a search algorithm? (2marks)

Question FIVE

Imagine you are a knowledge engineer developing an expert system for animal identification. The expert system it to be used as a learning aid in primary schools. The system should ask

questions concerning the animal, such as appearance, behaviour, habitat, and so on, and then attempt to identify the animal in question.

(a) Give examples of how you would represent knowledge about 2 possible animals in the system, for example

(I) cows, and

(II) pigeons

in the knowledge base, using

(i) rules, [4 marks]

(ii) frames, [4 marks]

(iii) networks. [4 marks]

b) Suppose you have the following search space:

State	next	cost
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. (4marks)

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 (4marks)