



TECHNICAL UNIVERSITY OF MOMBASA

Institute of Computing & Informatics

UNIVERSITY EXAMINATION FOR

**BTIT/SEP2014/J-FT Y4S1, BMCS/SEP2014/J-FT, BTAP/SEP2014/J-FT
BSSC/SEP2014/J-FT**

EIT 4316 /EIT 4406: Artificial Intelligence /Principles of Artificial Intelligence

SPECIAL/SUPPLEMENTARY EXAMINATION

SERIES: SEPTEMBER, 2018

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) Choose a domain that you are familiar with, write a description of an agent and its environment. Characterize the environment as either accessible, deterministic, episodic, static or continuous or not. Describe the agent architecture best fitted for this domain. (6marks)
- e) 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 Mombasa international airport. Describe how you would apply pattern recognition in your professional work. (4 marks)
- f) Discuss your understanding of Natural language processing (2marks)

QUESTION TWO

- (a) Discuss any two reasons why philosophy 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 Blind search as a problem-solving technique in A. I (2 marks)
- (ii) Show how a search problem may be specified. (3 marks)
- (iii) Describe the Heuristics 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. (2 marks)
- (b) Explain any two factors that influence and determine the success of an intelligent agent (4 marks)
- c) Explain the Turing test in relation to A. I (2marks)
- d) List and explain any four characteristics used to evaluate a search state strategy (8marks)
- e) Describe genetic algorithms. (2marks)
- f) List two types of applications that use genetic algorithms. (2marks)

QUESTION FIVE

Imagine you are a knowledge engineer developing an expert system for animal identification. The expert system is 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 cows and pigeons in the knowledge base, using
- (i) rules, (4 marks)
- (iii) Semantic networks. (4marks)
- 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. Execute the following search algorithms and show at each step what nodes are in the queue, at each step show the list of nodes expanded.
 - i. BFS (4marks)
 - ii. DFS (4marks)