(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

UNIVERSITY EXAMINATIONS

2017/2018 ACADEMIC YEAR

END OF SEMESTER EXAMINATIONS

YEAR 1 SEMESTER 2

FOR THE DEGREE OF

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

COURSE CODE : MIT 823

COURSE TITLE : ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

DATE: 20/10/2018 **TIME:** 9.00 AM – 12.00 PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS.

QUESTION ONE (COMPULSORY) [30 MARKS]

a) Explain the following terms as used in Artificial Intelligence (AI). [10 marks]
   i. Artificial Intelligence
   ii. Intelligent Agent
   iii. State Space Search
   iv. Problem space
   v. Expert system

b) Explain the categories of Problem solving methods [2 marks]

c) Discuss at least four application areas of AI [8 marks]

QUESTION TWO [20 MARKS]

a) Using the example of a robot chef which should plan and then cook a meal, identify the features of problem-solving systems. [8 marks]

b) State steps that must be taken toward developing a problem solving system [4 marks]

c) Before we solve a problem using state space search, we must define an appropriate state space. Identify a problem that may require AI techniques to solve. Then find a good state space representation for the identified problem. [8 marks]

QUESTION THREE [20 MARKS]

a) Discuss why search is important in problem-solving in AI. [4 marks]

b) Explain the following search strategies and give an example of a problem where each strategy would work better. :
   i. Depth-first search [5 marks]
   ii. Breadth-first search [5 marks]

c) Production systems are a good way to describe the operations that can be performed in a search for solution to a problem. What is a production system as used in AI and what does it consist of? [6 marks]

QUESTION FOUR [20 MARKS]

a) Explain the properties a good system for the representation of knowledge in a particular domain should possess. [8 marks]

b) State at least three approaches to knowledge representation. [3 marks]
c) Discuss the importance of developing ontology especially in the AI field? [3 marks]
d) Discuss the two main components of natural language processing [6 marks]

QUESTION FIVE [20 MARKS]

a) Machine learning is autonomous acquisition of knowledge through the use of computer programs.
   i. State components that support the basic learner components in any model of learning [3 marks]

   ii. Outline factors that affect the performance of a learner system [3 marks]

b) Discuss at least two heuristic search techniques [4 marks]
c) Discuss the Natural Language Processing Stages the Systems will have to go through [10 marks]