



*(Knowledge for Development)*

## **KIBABII UNIVERSITY**

**UNIVERSITY EXAMINATIONS  
2016/2017 ACADEMIC YEAR**

**SUPPLEMENTARY**

**END OF SEMESTER EXAMINATIONS  
YEAR TWO SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE OF MASTER OF SCIENCE  
IN INFORMATION TECHNOLOGY**

**COURSE CODE : MIT 823  
COURSE TITLE : ARTIFICIAL INTELLIGENCE  
AND EXPERT SYSTEMS**

**DATE: 30/09/2017 TIME: 02:00 PM – 05:00 PM**

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTIONS ONE AND ANY OTHER TWO.**

**QUESTION ONE (COMPULSORY) [30 MARKS]**

**QUESTION ONE [20 MARKS]**

- a) Explain the following terms as used in Artificial Intelligence (AI). [10 marks]
- i. Artificial Intelligence
  - ii. State Space Search
  - iii. Intelligent Agent
  - iv. Expert system
  - v. Speech recognition systems
- b) Discuss at least five application areas of AI [10 marks]

**QUESTION TWO [20 MARKS]**

- a) Explain the categories of Problem solving methods [2 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]
- d) State at least three approaches to knowledge representation. [3 marks]

**QUESTION THREE [20 MARKS]**

- a) Differentiate between
- i. Depth-first search and Breadth-first search [8 marks]
  - ii. Goal driven system and Data driven system [6 marks]
- b) What is a production system as used in AI and what does it consist of? [6 marks]

#### QUESTION FOUR [20 MARKS]

- a) State at least four requirements of an efficient Expert System user interface [4 marks]
- b) You have been appointed as an ICT manager in a Company where the managers needs expertise employees hired. The Head of Human Resource Department fronted for hiring expertise human beings while the Head of Information and Communication Technology insisted on acquiring expert systems.
- i. Discuss the grounds that the Human Resource Manager can use to justify for hiring human experts instead of an expert system. [5 marks]
  - ii. Discuss the grounds the Head of ICT can use to justify for hiring human experts instead of an expert system. [5 marks]
- c) Differentiate between
- i. Mundane Task and FormalTask in artificial intelligence [3 marks]
  - ii. Domain knowledge and Case knowledge [3 marks]

#### QUESTION FIVE [20 MARKS]

- a) Explain at least four features and capabilities to consider when evaluating building tools for Expert System development. [4 marks]
- b) What is Machine learning? Explain at least three application areas of Machine learning [6 marks]
- c) Discuss at least two heuristic search techniques [4 marks]
- d) Discuss the two main components of natural language processing [6 marks]