



# **MAASAI MARA UNIVERSITY**

**REGULAR UNIVERSITY EXAMINATIONS  
2018/2019 ACADEMIC YEAR  
FOURTH YEAR FIRST SEMESTER**

**SCHOOL OF SCIENCE & INFORMATION SCIENCES  
BACHELOR OF SCIENCE IN COMPUTER  
SCIENCE**

**COURSE CODE: COM 418  
COURSE TITLE: EXPERT SYSTEMS**

**DATE: 5<sup>TH</sup> DECEMBER 2018**

**TIME: 8.30 – 10.30 A.M.**

---

**INSTRUCTIONS:**

**SECTION A IS COMPULSORY ATTEMPT TWO QUESTIONS IN  
SECTION B**

This paper consists of 2 printed pages. Please turn over.

- a. Below are multiple choice questions choose the correct answer/answers, some questions have more than one answer ( 10 marks)

- i. Which of the following characteristics should an intelligent agent (IA) possess?
- a) Ability to reason about.
  - b) Capable of detecting the occurrence of a conflicting situation among a group of IAs.
  - c) Always follows exactly the actions of an opponent.
  - d) Able to learn and adapt from past experiences.
- ii. A Multi-Agent (MA) System can be described as
- a) A system composed of multiple intelligent agents.
  - b) A system with a coordinating intelligent behaviour among a collection of intelligent agents.
  - c) A group of intelligent agents processing information set in a fixed sequence.
  - d) A collection of intelligent agents, capable of coordinating their knowledge, goals, skills and plan jointly to solve a complex problem.
- iii. The Expert system within Force Readiness Expert System (FRESH) performs the following tasks except
- a) Generates alternative actions for various events that have taken place.
  - b) Assesses the positive and negative impact of these alternative actions on fleet operations.
  - c) Plans military operations.
  - d) Communicates orders/commands to and from various intelligent systems.
- iv. Which of the following best describes Distributed Artificial Intelligence (DAI)?
- a) It solves problems intelligently.
  - b) Several distributed intelligent agents coordinate to solve a complex problem.
  - c) Intelligent agents solve their problems individually using Artificial Intelligence.
  - d) Incorporating techniques of Artificial Intelligence into distributed system.
- v. In a distributed environment, the intelligent agents
- a) Are decentralized.
  - b) Are centralized.
  - c) Share a common information set when solving a complex problem.
  - d) Solve the complex problem individually, compare the solutions and choose the best answer.

vi. Which of the following systems mimics human thinking?

- a) Artificial intelligence
- b) Intelligent agent
- c) Bot
- d) Database management system

vii. The first widely-used commercial form of Artificial Intelligence (AI) is being used in many popular products like microwave ovens, automobiles and plug in circuit boards for desktop PCs. It allows machines to handle vague information with a deftness that mimics human intuition. What is the name of this Artificial Intelligence?

- a) Boolean logic
- b) Human logic
- c) Fuzzy logic
- d) Functional logic

viii. In his landmark book Cybernetics, Norbert Wiener suggested a way of modeling scientific phenomena using not energy, but

- a) mathematics
- b) intelligence
- c) information
- d) history

ix. Input segments of AI programming contain(s)

- a) sound
- b) smell
- c) touch
- d) sight and taste
- e) All of the mentioned

x. Which Intelligent Agent will monitor systems and report back to you when there is a problem?

- a) Shopping bot
- b) Buyer agent
- c) Information agent
- d) Predictive agent

- b. Define the following terminologies ( 8 marks)
  - i. An expert system
  - ii. Knowledge engineering
  - iii. Knowledge engineer
  - iv. Domain expert
- c. Discuss the characteristics of an expert system and give two examples of expert systems ( 4 marks)
- d. Mention four features of expert system shells ( 4 marks)
- e. State four capabilities of an expert system (4 marks)

**QUESTION TWO ( 20 MARKS)**

- a. State four different knowledge representation techniques ( 4 marks)
- b. Discuss the need for expert system tool while building expert system ( 3 marks)
- c. Discuss five applications of expert systems ( 10 marks)
- d. Briefly discuss the use of meta knowledge ( 3 marks)

**QUESTION THREE ( 20 MARKS)**

- a. Discuss three stages of knowledge acquisition process ( 6 marks)
- b. Discuss the stages of knowledge elicitation process ( 8 marks)
- c. There are several useful techniques for acquiring this knowledge discuss three of them (6 marks)

**QUESTION FOUR ( 20 MARKS)**

- a. Discuss forward chaining and backward chaining and how an expert system applies them in making conclusions ( 4 marks)
- b. Discuss a knowledge base ( 2 marks)
- c. Briefly discuss fuzzy logic and state four application of fuzzy systems ( 4 marks)
- d. Using a well labelled diagram, discuss the expert system architecture ( 10 marks)

**//END**