



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (MATHS AND COMPUTER SCIENCE)

SCO 113: FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

DATE: 3/5/2019

TIME: 11.00-1.00 PM

INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions.

QUESTION ONE (30 MARKS) (COMPULSORY)

- a) State three types of intelligence (3 marks)
- b) Discuss four applications of Artificial Intelligence (8 marks)
- c) Distinguish between Modus Ponens and Modus Tollens using examples in each case. (4 marks)
- d)
 - i Explain two algorithms that can be used to create games in artificial Intelligence. (4 marks)
 - ii Distinguish between a universal and existential quantifier with the aid of an example. (4 marks)
- e) State three algorithms that can be used for machine learning applications. (3 marks)
- f) Identify a real life environment for a robot and discuss using PAGE description method. (4 marks)

QUESTION TWO (20 MARKS)

- a) Distinguish between symbolic and non-symbolic computing (4 marks)
- b) Frames and Semantic networks are knowledge representation schemes. Briefly state any three advantages for each of these schemes. (6 marks)
- c) Write the following statements in predicate Logic:
 - i. Some dogs bark. (2 marks)

- ii. Barking dogs are irritating. (2 marks)
- d) Show how production rules can be used in reasoning using an illustration. (6 marks)

QUESTION THREE (20 MARKS)

- a) Explain five techniques that can be used for heuristics search. (10 marks)
- b) You have been selected to be part of the 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 the system. (10 marks)

QUESTION FOUR (20 MARKS)

- a) Discuss five methods that can be used to analyze a search strategy. (10 marks)
- b) Given the 8-puzzle problem below, show how to move from the initial state to the goal state using heuristic function. (10 marks)

Initial State

1	2	3
5	6	4
8		7

Goal State

1	2	3
4	5	6
7	8	

QUESTION FIVE (20 MARKS)

- a) Given the facts below:

Facts:

likes(john,flowers).

likes(john,mary).

likes(paul,mary).

Evaluate the following goals:

- i. ?likes (john, flower).
 - ii. ?likes (john, flowers).
 - iii. ?likes (john, mary).
 - iv. ?likes (john, X).
 - v. ?likes (X, mery). (10 marks)
- b) Discuss five disciplines from which artificial intelligence borrows concepts. (10 marks)