



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)

SCO 205: INTRODUCTION TO 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)