



MACHAKOS UNIVERSITY

University Examinations for 2016/2017

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE IN MATHEMATICS AND COMPUTER SCIENCE

BACHELOR OF SCIENCE IN MATHEMATICS

SC0 113: FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

DATE: 31/5/2017

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

Answer all questions in section A and any two questions from section B

QUESTION ONE (30 MARKS) [COMPULSORY]

- a) State three types of intelligence (3 marks)
- b) Describe four applications of Artificial Intelligence in Kenya today (8 marks)
- c)
 - i) Outline two knowledge inference techniques according to De' Morgan (2 marks)
 - ii) Prove one of the laws above either using set theory or truth tables (4 marks)
- d) Explain two attributes of an intelligent agent environment (4 marks)
- e) Distinguish between a universal and existential quantifier with the aid of an example. (4 marks)
- f) Write a PROLOG program that can be used for diagnosis. The program should include at least three symptoms for a disease of your choice, at least one rule and a goal. (5 marks)

QUESTION TWO (20 MARKS)

- a) Distinguish between symbolic and non-symbolic computing (4 marks)
- b) With the aid of a well labelled diagram, discuss semantic networks. (6 marks)
- c) Explain the principal components of a Production System. (6 marks)
- d) Show that $\neg (\neg (P \wedge Q)) \equiv \neg (\neg (\neg (\neg P \vee \neg Q)))$ using truth tables (4 marks)

QUESTION THREE (20 MARKS)

- a) Discuss five types of knowledge that can be represented and used to solve problems in Artificial intelligence. (10 marks)
- b) With the aid of examples, explain the main approaches to Artificial Intelligence that embodies all its concepts and theories. (10 marks)

QUESTION FOUR (20 MARKS)

- a) Explain two game playing techniques in A.I. (6 marks)
- b) Discuss the difference between intelligent systems and conventional systems. (4 marks)
- c) 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 FIVE (20 MARKS)

- a) With the aid of a well labeled diagram, explain the components of an expert system. (10 marks)
- b) Justify the statement that “Artificial Intelligence is Multi-disciplinary” (4 marks)
- c) Difference between Human and Machine Intelligence. (4 marks)
- d) Explain Natural Language Processing as used in AI. (2 marks)