



UNIVERSITY OF KABIANGA

UNIVERSITY EXAMINATIONS 2017/2018 ACADEMIC YEAR THIRD YEAR FIRST SEMESTER EXAMINATION

FOR THE DEGREE IN BACHELOR OF INFORMATION SCIENCE AND KNOWLEDGE MANAGEMENT

COURSE CODE: ISK 341

**COURSE TITLE: ARTIFICIAL INTELLIGENCE AND EXPERT
SYSTEMS**

DATE: 31ST JANUARY, 2018

TIME: 9.00 A.M - 12.00 NOON

INSTRUCTIONS TO CANDIDATES

- SEE INSIDE

THIS PAPER CONSISTS OF (4) PRINTED PAGES

PLEASE TURN OVER

TOWN CAMPUS

KABIANGA UNIVERSITY

ISK 341: ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS

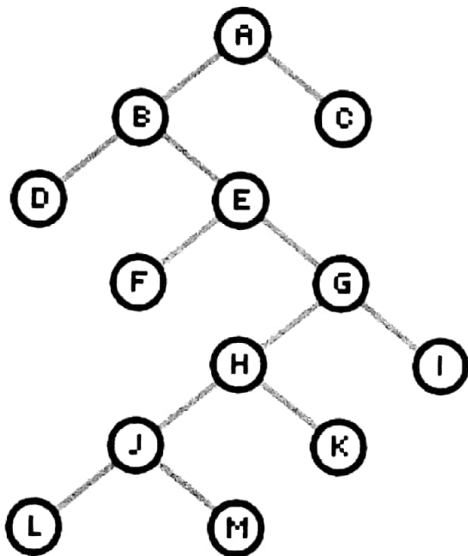
INSTRUCTIONS: ANSWER QUESTION ONE AND ANY OTHER TWO QUESTIONS

Question One (30 Marks)

a) Explain the following terms: (8 Marks)

- (i) Artificial Intelligence
- (ii) Expert system
- (iii) Neural networks
- (iv) Fuzzy expert system

b) Given the tree below perform depth-first search for the goal node **V**. Show the content on the stack. (6 Marks)



c) Convert each of the following facts to First Order Logic: (10 Marks)

- (i) Everyone is related to someone who is retired.
- (ii) For any x and y, if x is older than y, then y is younger than x
- (iii) All freighters are ships
- (iv) The mother and the child is the female parent

- (v) Some intelligent student study computer science
- d) Differentiate between blind and heuristic search algorithms, as you explain give two examples of each (4 Marks)
- e) Describe any four applications of genetic algorithms. (2 Marks)

Question Two (20 Marks)

- a) Discuss the advantages and disadvantages and depth – first search and breadth – first – search. (6 Marks)
- b) Explain the role of the intelligent agents and their potential benefits. (8 Marks)
- c) Describe any **three** major AI technologies. (6 Marks)

Question Three (20 Marks)

- a) Describe the major components of an expert system. (6 Marks)
- b) Internet games have become very popular. Designing a good computer game needs to use 3D graphics and artificial technologies. Discuss what AI techniques are able to make computer entertainment more exciting and challenging. (8 Marks)
- c) Explain the meaning of the following terms as used in artificial intelligence: (6 Marks)
- (i) Syntax
 - (ii) Semantics

Question Four (20 Marks)

- (a) Explain the following agents in AI:
- (i) simple reflex agents [4 marks]
 - (ii) goal –based agents [4 marks]
- (b) Explain the following uninformed search strategies in terms completeness, time complexity, space complexity and optimality
- (i) Breath-first search [4 marks]
 - (ii) Uninform cost search [4 marks]
 - (iii) Depth-first search [4 marks]

Question Five (20 Marks)

- a) Explain the following terms as used in AI and expert systems:(10 Marks)
- (i) State
 - (ii) State space
 - (iii) Heuristic function
 - (iv) Task environment
 - (v) Successor function
- b) Describe any three methods of conflict resolution in rule based systems.
(6 Marks)
- c) Describe any five characteristics of a good knowledge representation scheme.
(4 Marks)