



MAASAI MARA UNIVERSITY

**REGULAR UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR**

**SCHOOL OF SCIENCE & INFORMATION SCIENCE
EXAMINATIONS FOR BACHELOR OF COMPUTER
SCIENCE**

**COURSE CODE: COM 319
COURSE TITLE: ARTIFICIAL INTELLIGENCE**

DATE: 17TH APRIL, 2018

TIME: 11:00AM-1:00PM

INSTRUCTIONS

1. Answer Question ONE and any other TWO Questions From Section II
2. Question 1 is compulsory.
3. Time 2HRS.
4. **SWITCH OFF** your mobile phone.

This paper consists of 4 printed pages. Please turn over.

Section I, Compulsory

(30 marks)

- (a) Briefly describe Logical-Mathematical Intelligence, what kind of a job would you recommend for people who possess this kind of intelligence? **(4 marks)**
- (b) Outline the four important attributes a computer must have to pass the Turing test. **(4 marks)**
- (c) Explain two main views of intelligence? **(4 marks)**
- (d) How have the disciplines of engineering and computer science contributed to A.I **(4 marks)**
- (e) Define learning' as used in the field of artificial intelligence. **(2 marks)**
- (f) Compare and contrast the Von Neumann architecture and the human brain. **(4 marks)**
- (g) Translate the statement "All howling dogs are irritating" into Logic. **(3 marks)**
- (h) You wish to design an agent that would switch and off classroom lights as needed. Describe possible Goals? Percepts? Sensors? Effectors? Actions? **(5 marks)**

Section II, Answer any two Questions maximum (40 marks)

Question 2

(a) Represent the following English sentences using predicate calculus. **(10 marks)**

- i. Emma is a Doberman pinscher and a good dog.
- ii. If it doesn't rain on Monday, Tom will go to the mountains
- iii. All basketball players are Tall
- iv. Some people like Anchovies.
- v. If wishes were horses, beggars would ride.

(b) Having studied knowledge representation formalisms, use frames to represent the university computer laboratory. You are expected to identify at most three objects which should be clearly represented. **(10 marks)**

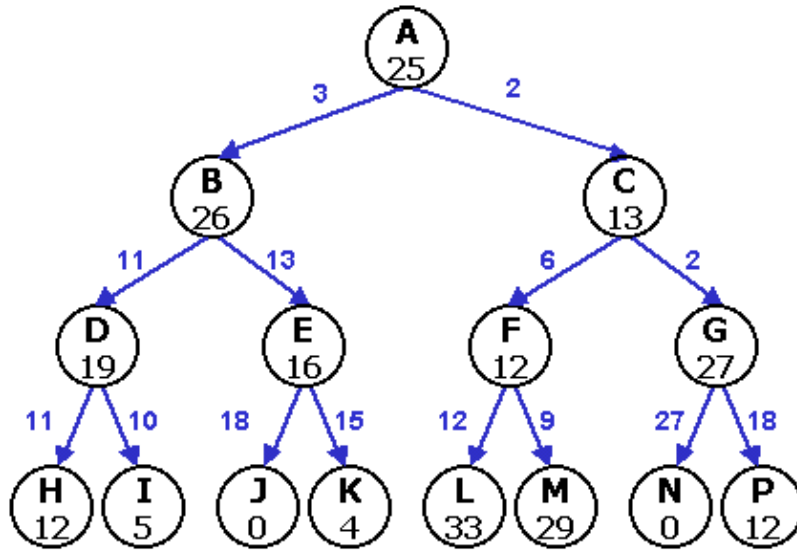
Question 3

- (a) Define an agent and outline the difference between an agent and a software. **(12 marks)**
- (b) Briefly describe any four types of agent environments. **(8 marks)**

Question 4

- (a) Outline the main difference between heuristic search and uninformed search. **(4 marks)**
- (b) Describe at least four characteristics of heuristic searches. **(8 Marks)**

A search tree is shown below where each circle represents a node corresponding to a state in the search space. The estimated cost (i.e. h function) for finding a solution from a node is shown in its circle. The two nodes with $h = 0$ are goal states and the other terminal nodes are dead-ends. (i.e. states that can never reach a goal). Actual link costs are marked on the links between the nodes. Thus the path cost (i.e. g function) of a node is equal



to the sum of the link costs from the root to that node.

(i) Using the (blind) depth-first search algorithm, give the sequence of nodes expanded before a goal state is reached. What is the path cost? **(4 marks)**

(ii) Using the greedy search algorithm, give the sequence of nodes expanded before a goal state is reached. What is the solution path and what is its path cost? **(4 marks)**

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