



# **MAASAI MARA UNIVERSITY**

**REGULAR UNIVERSITY EXAMINATIONS**

**2021/2022 ACADEMIC YEAR**

**SECOND YEAR FIRST SEMESTER EXAMINATION**

**SCHOOL OF PURE, APPLIED AND HEALTH SCIENCES**

**DEGREE OF BACHELOR OF SCIENCE (COMPUTER  
SCIENCE)**

**COURSE CODE: COM 2113-1**

**COURSE TITLE: ARTIFICIAL INTELLIGENCE**

**DATE: 31<sup>ST</sup> MARCH 2022**

**TIME: 11.00Am-1.00pm**

**INSTRUCTIONS TO CANDIDATES**

- **Question ONE in Section “A “ is Compulsory**
- **Answer any Two (2) Questions from Section “B”**
- **Illustrate your answers where necessary**

## SECTION A

### QUESTION ONE (COMPULSORY 30 MARKS)

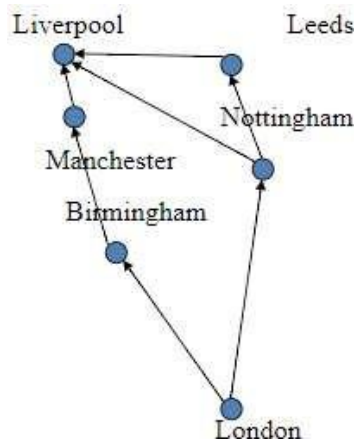
- a) Corona virus disease has resulted to many global challenges. Describe any two of these challenges and explain how artificial intelligence applications can be used to solve them **(4Marks)**
- b) State and explain three branches of artificial intelligence **(6Marks)**
- c) Describe five characteristics of a good knowledge representation technique **[5 Marks]**
- d) Define the term "Artificial Intelligence" **(2marks)**
- e).Given that p is true and q is false, use a truth table to determine the truth value of the following expression

$$(\sim p \vee q) \vee \sim q.$$

**(2Marks)**

- e) A tourist is on holiday in UK; currently he is in London. He want to take flight Tomorrow to Liverpool though he don't know the path to liver pool. Use the following map to define any five elements of his search problem

**(5 Marks)**



- b) Consider the following propositions

*Cat is mammal, mammal is an animal, cat has fur, and bear has fur*

- i)Construct Semantic Network **(4 Marks)**

(ii) Convert the semantic network constructed in (3d) into predicate logic

**(2 Marks)**

## **SECTION B**

### **QUESTION TWO (20marks)**

a) Describe any three types of human intelligence and explain the tools for improving each type of intelligence and potential careers

**[6Marks]**

b) State and explain three branches of artificial intelligence

**[6Marks]**

c) Briefly explain the meaning of the following artificial intelligence terms and give one example for each case:

**(8marks)**

(i) Knowledge representation

(ii) Heuristics

(iii) Backward chain reasoning

(iv) forward chain inferencing

### **(QUESTION THREE 20MARKS)**

a) Describe any three artificial intelligence applications

**[3 Marks]**

b) Briefly explain the meaning of the following artificial intelligence terms and give one example

**(4marks)**

(i) Atomic sentence

ii) Proposition

(iii) Predicate

(iv) Logical connective

b) . Explain three reasons why we study games in artificial intelligence

**[3marks]**

c) Explain the difference between mini-max and alpha beta algorithms

**[2marks]**

e) Translate the following statements into predicate logic

**[4Marks]**

i. All men are mortal

ii. All MMAU students are good

(f) Describe the difference between the following inferencing techniques. Use an example to illustrate each method

i) Inductive and deductive Inference

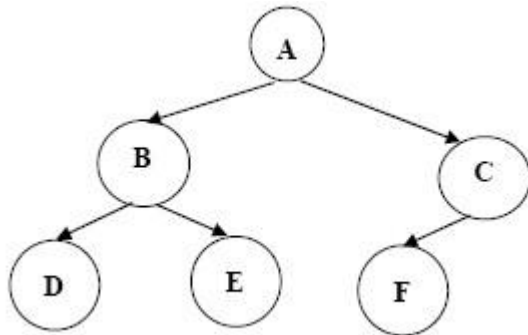
[2Marks].

ii) Backward chaining and Forward chaining inference

[2Marks]

**QUESTION FOUR (20 marks)**

(a) Consider the search tree below



Assuming F is the Goal node, use each of the following methods to find a path from

A to F. i. Depth-first search **(3 Marks)**

ii. Breadth-first search **(3Marks)**

(b) Many matatus in Nairobi have drivers and conductors (*manambas*). The two work together. Lets assume that both are intelligent agents. (the setting is before 2003, before the new psv regulations were affected)

Fill-in the table below for the conductor (manamba) **(4 Marks)**

Goals	
enviroment	
Percepts	
sensors	
Actions	
effectors	

(c) There are four main participants that are involved in the development and implementation of expert systems. State and explain each of these roles

**(4 Marks)**

(d). Describe three types of robots and explain how they can be applied to address challenges associated to corona virus disease **(6 Marks)**

/////END/////



