



(Knowledge for Development)
KIBABII UNIVERSITY

**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR**

**END OF SEMESTER EXAMINATIONS
YEAR TWO SEMESTER ONE EXAMINATIONS**

**FOR THE DEGREE OF BACHELOR OF SCIENCE
COMPUTER SCIENCE**

COURSE CODE : CSC217

**COURSE TITLE : INTRODUCTION TO ARTIFICIAL
INTELLIGENCE.**

DATE: 19/12/2022

TIME: 2:00 P.M. – 4:00 P.M.

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

a) Describe the following terms

I. Multi-agent

II. Artificial Intelligence

[2 Marks]

b) Explain what natural language processing is.

[4 Marks]

c) Describe the eras of computing that exist and draw appropriate diagram.

[6 Marks]

d) Describe the disadvantage of breadth search.

[4 Marks]

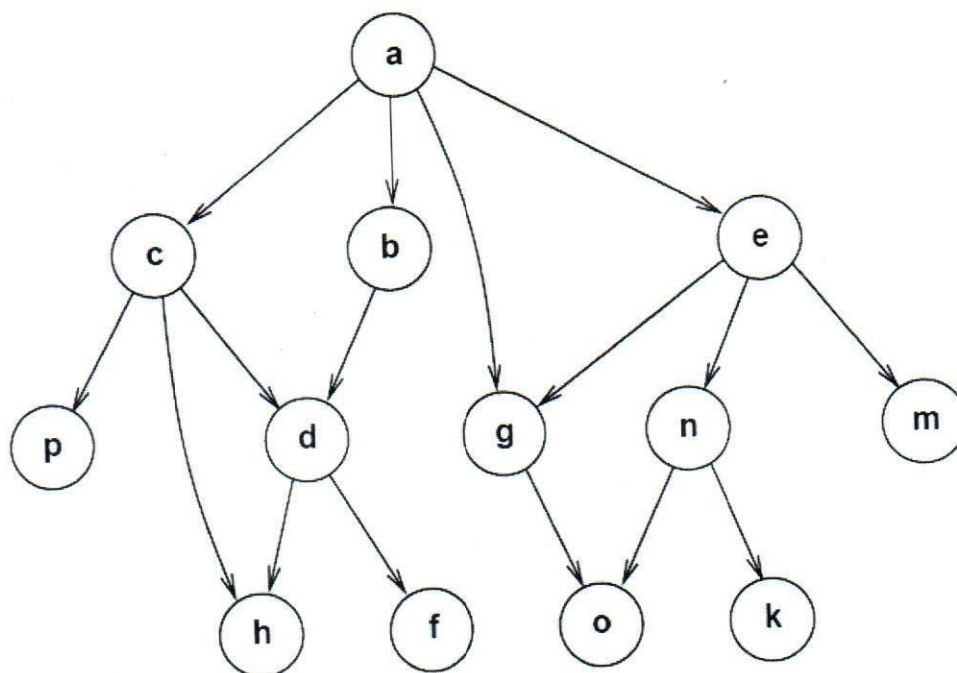
e) Describe the special property of red-black trees and what root should always be

[4 Marks]

f) Describe 3 innovations in artificial intelligence that will help change our lives

[4 Marks]

g) Consider the following state space, where each node represents a state, and each directed link represents an operation.



Suppose the state space is to be searched, starting at node "a". List the nodes of the state space in the order that they are expanded for each of the following search methods.

Assume that the search considers child nodes from left to right. State any other assumptions you make. [6 Marks]

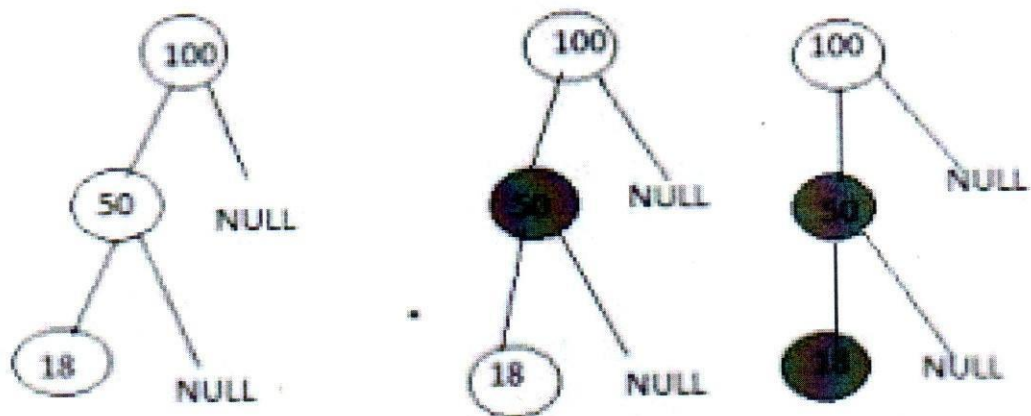
- i. Depth First Search.
- ii. Breadth First Search.
- iii. Iterative Deepening:

QUESTION TWO [20 MARKS]

a) With the aid of relevant diagram describe the relationship between percepts, environment and actions. [4 Marks]

b) Describe utility-based agents. [6 Marks]

c) Consider the below formations of red-black tree.



All the above formations are incorrect for it to be a red black tree. then what may be the correct order?

[4 Marks]

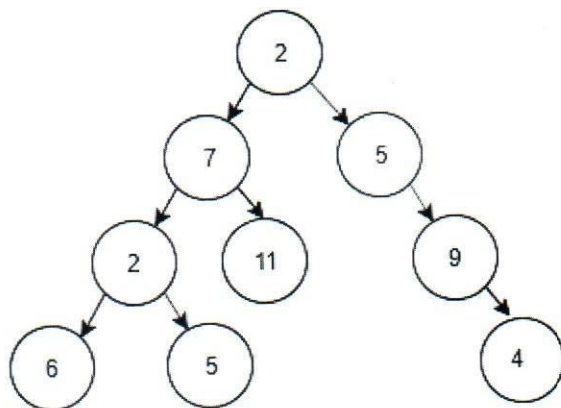
d) Distinguish between the following environments:

- I. Accessible and inaccessible
- II. Deterministic vs Non deterministic

[6 Marks]

QUESTION THREE [20 MARKS]

- a) For the tree below write the in-order traversal, preorder and post order traversals [6 Marks]



- b) Describe THREE issues in knowledge representation. [6 Marks]
- c) Describe the effectiveness of Alpha-Beta in game playing [6 Marks]
- d) Describe the advantage of depth first search. [4 Marks]

QUESTION FOUR [20 MARKS]

- a) Define semantic web [2 Marks]
- b) Explain what neural networks and deep learning are, and why they are important in today's AI field. [6 Marks]
- c) Describe the difference between deduction and induction [4 Marks]
- d) Describe machine learning types and approaches [8 Marks]

QUESTION FIVE [20 MARKS]

- a) Differentiate between human and machine intelligence. **[4 Marks]**
- b)
- i. Draw the binary search tree that is created if the following numbers are inserted in the tree in the given order. 12 15 3 35 21 42 14 **[3 Marks]**
 - ii. Draw a balanced binary search tree containing the same numbers given in part i **[3 Marks]**
- c)
- i. Describe the Intelligent agent.
 - ii. Describe the properties of the intelligent agents. **[6 Marks]**
Situatdness
- d) Describe some of the AI approaches, as well as approaches from other disciplines, used in robotics applications. **[6 Marks]**