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**UNIVERSITY EXAMINATIONS
2022/2023 ACADEMIC YEAR**

**SPECIAL/SUPPLEMENTARY 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: 03/08/2023

TIME: 8:00 P.M – 10:00 A.M

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

- a) Describe the following terms
 - I. Minimum spanning tree
 - II. Binary tree [2 Marks]
- b) Difference in Robot System and Other AI Program [4 Marks]
- c) Describe the eras of computing that exist and draw appropriate diagram. [6 Marks]
- d) Describe the applications of Robotics [4 Marks]
- e) Determine whether the following statements are **TRUE/FALSE**
 - i. A machine will never be intelligent until understands sentences like “The horse raced past the barn fell.”
 - ii. Because machines aren’t limited by short-term memory, they will eventually understand and translate languages better than people do
 - iii. AI machines are so far better at playing checkers than recognizing your mother.
 - iv. Forward chaining inference is especially suitable for diagnosis or troubleshooting
 - v. The independence assumption is why probabilistic reasoning is especially reliable
 - vi. Semantic networks, frames and classes all share a similar technique for inferring common properties [6 Marks]
- f) Describe business analytics [4 Marks]
- g) Describe the factors that contributed to the growth of AI [4 Marks]

QUESTION TWO [20 MARKS]

- a) Describe semantics and syntax terms used in Natural language processing [4 Marks]
- b) Describe Goal Based Agents with aid of a diagram [6 Marks]
- c) Differentiate between classification and regression [4 Marks]
- d) Distinguish between the following environments:
 - I. Single Agent and Multi-agent
 - II. Observable and partially observable [6 Marks]

QUESTION THREE [20 MARKS]

- a) Describe natural language processing challenges [4 Marks]
- b) Describe THREE natural language processing tools and services [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. **[6Marks]**
- 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]**
- d) Describe some of the AI approaches, as well as approaches from other disciplines, used in robotics applications. **[6 Marks]**