# UNIVERSITY EXAMINATIONS
# 2022/2023 ACADEMIC YEAR

## SPECIAL/SUPPLEMENTARY EXAMINATIONS
## YEAR THREE SEMESTER ONE EXAMINATIONS

## FOR THE DEGREE OF BACHELOR OF SCIENCE
## COMPUTER SCIENCE

**COURSE CODE** : CSC 360E

**COURSE TITLE** : **INTELLIGENT AGENTS**

**DATE: 31 /07/2023** **TIME: 11:00A.M – 1:00 P.M**

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**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTIONS ONE AND ANY OTHER TWO.**

## QUESTION ONE (COMPULSORY) [30 MARKS]

a) Describe the following terms

I. Rational Agent

II. Multiagent System **[2 Marks]**

b) Differentiate between an agent and an Object. **[4 Marks]**

c) Describe the **TWO** components of practical reasoning **[6 Marks]**

d) Describe the **FOUR** limitations of reactive systems **[4 Marks]**

e) Determine whether the following statements are **TRUE/FALSE**

i. An intelligent agent is software that assists you, or acts on your behalf, in performing repetitive computer-related tasks

ii. Multi-agent systems are dependent intelligent agents that interact with each other.

iii. Water fall model is an agent-oriented methodology

iv. Coordination is a must-have functionality in any Multiagent System implementation

v. It can be said that in closed environments trust is implicit.

vi. A contract is a statement of intent that regulates behavior among organizations and individuals **[6 Marks]**

f) List the FOUR components of Agent Speak architecture **[4 Marks]**

g) Describe the Two Problems of Symbolic reasoning Agents **[4 Marks]**

## QUESTION TWO [20 MARKS]

a) Distinguish between trust and reputation **[4 Marks]**

b) Describe the disadvantages of centralized coordination. **[6 Marks]**

c) Describe the Main criticism to Trust and Reputation research. **[4 Marks]**

d) Describe any TWO examples of trust/reputation models **[6 Marks]**

## QUESTION THREE [20 MARKS]

a) Distinguish between horizontal layering and vertical layering **[2 Marks]**

b) Although being very diverse in application and form, robots all share three basic similarities when it comes to their construction. Describe the three similarities. **[6 Marks]**

c) Describe **THREE** application areas of robots. **[6 Marks]**

d) Describe the **SIX** properties of Intelligent agents. **[6 Marks]**

## QUESTION FOUR [20 MARKS]

a) Describe the **TWO** main viewpoints in agent development **[4 Marks]**

b) Explain the steps followed in Prometheus agent-oriented methodologies. **[6 Marks]**

c) Using Prometheus methodology create a solution that can solve any of the big four agenda problem in Kenya. Break down the steps clearly using Prometheus methodology for the selected problem you want to offer a solution using Multi agent-based System. **[10 Marks]**

## QUESTION FIVE [20 MARKS]

a) Describe the role of the following in GAIA agent-oriented methodologies

- **i.** Protocols **[2 Marks]**
- **ii.** Permissions **[2 Marks]**
- **iii.** Responsibilities **[2 Marks]**

b) Describe the SMART Normative systems model **[4 Marks]**

c)

- i. Draw a diagram for Touring Machines agent architecture **[4 Marks]**
- ii. Describe the overall operation of the architecture, making you explain how the decision layers achieve the goal of reactive and proactive behaviour. **[6 Marks]**