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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2022/2023 ACADEMIC YEAR
THIRD YEAR, SECOND SEMESTER EXAMINATION
FOR THE BACHELOR OF BUSINESS INFORMATION TECHNOLOGY
KBI 2312 – SIMULATION AND MODELLING

Date: 14TH DECEMBER 2022
Time: 11:30AM – 1:30PM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Why do we build models (as opposed to experiment on actual systems)? (6 Marks)
- b) Explain the concept of Discrete-Event Simulation. (6 Marks)
- c) State four types of algebraic methods (4 Marks)
- d) With an example, define the term Monte Carlo Method (4 Marks)
- e) Explain the meaning of Queuing theory (3 Marks)
- f) List the core elements of an AML (Algebraic modeling languages): (4 Marks)
- g) Explain the Stochastic Model (3 Marks)

QUESTION TWO (20 MARKS)

- a) Monte Carlo methods vary, but tend to follow a particular pattern, explain the steps that are followed in the Monte Carlo Simulation. (8 Marks)
- b) The simulation model building can be broken into 4 phases, discuss them (12 Marks)

QUESTION THREE (20 MARKS)

- a) There are various types of models, explain the following models: (9 Marks)
 - i) Static Model vs Dynamic Model
 - ii) Deterministic Model vs Stochastic Model
 - iii) Discrete Model vs Continuous Model
- b) With illustrations, Discuss the single server queue (7 Marks)
- c) Explain Model conceptualization as illustrated in the steps of simulation (4 Marks)

QUESTION FOUR (20 MARKS)

- a) Describe in detail the three-step approach for model validation? (9 Marks)
- b) Define congestion in a queuing system. (2 Marks)
- c) Describe different types of components and characteristics of a queueing system. (9 Marks)

QUESTION FIVE (20 MARKS)

- a) With the aid of a diagram, illustrate the Basic Steps of a Simulation Study (12 Marks)
- b) Explain the queuing system in simulation. (6 Marks)
- c) In a commonly seen queueing model, there is commonly used notation principle: A/B/C. What do the letters A, B and C indicate? (6 Marks)