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(Knowledge for Development)

KIBABII UNIVERSITY
(KIBU)

UNIVERSITY EXAMINATIONS
2019/2020 ACADEMIC YEAR

SPECIAL /SUPPLEMENTARY EXAMINATION
YEAR THREE SEMESTER TWO
FOR THE DEGREE
(INFORMATION TECHNOLOGY)

COURSE CODE : **BIT 415**
COURSE TITLE : **SIMULATION AND MODELING**

DATE: 16/02/2021

TIME: 8.00 AM - 10.00 AM

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTIONS ONE AND ANY OTHER TWO.

QUESTION ONE (COMPULSORY) [30 MARKS]

- a. What is decision table technique [2 marks]
- b. What is meant by boundary value analysis in software testing? [2 marks]
- c. Name and Explain **Three** different types of regression models [6 marks]
- d. What is the difference between Linear and nonlinear system? [4 marks]
- e. Name the Five Steps to Simulation [5 marks]
- f. Name the Four Techniques for Generating Random Numbers [5 marks]
- g. What are Uses of simulation modeling? [6 marks]

QUESTION TWO [20 MARKS]

- a. Explain the following typical black-box test design techniques [10 marks]
 - (i) State transition testing
 - (ii) Use case testing
 - (iii) User story testing
 - (iv) Domain analysis
 - (v) Syntax testing
- b. Give Three Examples of financial models [6 marks]
- c. State and explain the Four Assumptions in run test of randomness [4 marks]

QUESTION THREE [20 MARKS]

- a. Define the black box approach [2 marks]
- b. Define linear regression [2 marks]
- c. What does Linear in parameters mean in Linear Regression? [2 marks]
- d. Give the functions of the following System Models [6 marks]
 - (i) Context **models**
 - (ii) Data flow **models**
 - (iii) State machine **models**
- e. Define the following terms as used in simulation modelling [4 marks]
 - (i) Parameter estimation
 - (ii) Maximum Likelihood Estimation
 - (iii) Parameter estimates

(iv) Least Mean Square Error

- f. Give the **FOUR** reasons for the steadily increasing interest in simulation applications
[4 marks]

QUESTION FOUR [20 MARKS]

1. Explain the following types of simulation models [10 marks]
- (i) Task Trainer Simulation
 - (ii) Manikin-based Simulation
 - (iii) Standardized Patient Simulation
 - (iv) Virtual Reality Simulation
 - (v) Tissue-based Simulation
2. Briefly explain the basic features of MATLAB. [4 marks]
3. Give two Properties of Random Numbers [2 marks]
4. Briefly explain the applications of modeling and simulation [4 marks]

QUESTION FIVE [20 MARKS]

- a. Give the Difference between continuous Simulation and discrete event Simulation [4 marks]
- b. Name at least two functions of linear models [2 marks]
- c. Explain the following typical black-box test design techniques [10 marks]
- (i) Decision table testing
 - (ii) All-pairs testing
 - (iii) Equivalence partitioning
 - (iv) Cause Effect Graph
 - (v) Error guessing
- d. What is a building model? [2 marks]
- e. What is the function of Simulation Tools? [2 marks]