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**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATIONS, 2022/2022 ACADEMIC YEAR
FOR THE DEGREE OF BACHELOR OF BUSINESS IN INFORMATION
TECHNOLOGY**

**SPECIAL EXAMINATION
KBI 2301 - COMPUTER MODELLING AND DECISIONS**

Date: 15th December, 2022
Time: 2.30pm – 4.30pm

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

- a) Define an optimal inventory policy, and assess the impact on that optimal inventory policy of:
 - i) Uncertain demand and lead times (2 Marks)
 - ii) Customer reactions to product shortages (2 Marks)
 - iii) An oligopolistic product markets. (2 Marks)
- b) Discuss and explain the advantages for using computer simulation other than experimenting with real life systems? (4 Marks)
- c) Distinguish the following models
 - i) Deterministic vs Stochastic models
 - ii) Discrete vs Continuous models (6 Marks)
- d) State and explain any four examples of Computer simulation software. (4 Marks)

QUESTION TWO (20 MARKS)

- a) Discuss the different types of systems (6 Marks)
- b) What does a M/M/1 represent in queuing model? (3 Marks)

- c) Highlight common steps used to all digital simulation (4 Marks)
- d) i) What are the areas different in computer simulation languages (3 Marks)
- ii) What are the standard capabilities (4 Marks)

QUESTION THREE (20 MARKS)

- a) Explain the main steps followed in computer Modelling simulation study. (4 Marks)
- b) Explain the methods used to test the suitability of random numbers generated. (6 Marks)
- c) A computer repair person is 'beeped' each time there is a call for service. The number of beeps per hour has a Poisson distribution with mean 2 beeps per hour. Calculate the probability that there will be:
 - i) At least two beeps in an hour.
 - iii) One beep in next three hours.
 - iv) No beep in 45 minutes. (6 Marks)
- e) Consider simulating a single server queue; identify the exogenous and endogenous variables (4 Marks)

QUESTION FOUR (20 MARKS)

- a) Discuss the common random number generators commonly is use (6 Marks)
- b) Briefly discuss the different kinds of computer modeling systems (6 Marks)
- c) Discuss any two statistical techniques used to test for randomness when pseudo-random numbers are generated (4 Marks)
- b) Briefly explain any three common techniques used to generate random numbers (4 Marks)

QUESTION FIVE (20 MARKS)

- a) Briefly explain the properties of the Poisson distribution. (2 Marks)
- b) What are the advantages for using Computer simulation other than experimenting with real life systems? (5 Marks)
- c) What are the desired properties of a good random numbers generator (4 Marks)
- d) Discuss the different types of systems and there corresponding reliabilities of performance (9 Marks)