

**BINDURA UNIVERSITY OF SCIENCE EDUCATION**  
**DEPARTMENT OF COMPUTER SCIENCE**  
**BSc HONS DEGREE IN COMPUTER SCIENCE**  
**BSc HONS DEGREE IN INFORMATION TECHNOLOGY**  
**SIMULATION AND MODELLING- CS403**  
**DURATION: 2 hours 30 minutes      TOTAL MARKS: 100**

**INSTRUCTION TO CANDIDATES**Answer **all** questions.

Total marks are 100.

MAR 2024

**Question 1**

- a) Define a simulation model with the aid of an example. [3]
- b) Give three reasons why we simulate problems. [9]
- c) Briefly explain four reasons that makes a problem suitable for simulation and modelling analysis? [8]

**Question 2**

- a) Explain any four application areas of simulation and modelling. [8]
- b) Any simulation model has two inputs i.e controllable and probabilistic inputs. With the aid of examples differentiate controllable and probabilistic inputs. [8]
- c) Describe the two types of simulation models and explain the variations within each type. [8]

**Question 3**

- a) Differentiate between physical and mathematical simulation models. [6]
- b) With the aid of an illustration or algorithm give the "Steps in Simulation Model Building". [10]

**Question 4**

- a) Give steps followed in the Kolmogorov -Sminorv (K-S) test for uniformity. [10]
- b) Given the following numbers, test for uniformity using the K-S Test. [10]

0.44, 0.81, 0.14, 0.05, 0.93

**Question 5**

Discuss the factors that influence simulation and modelling [20]

\*\*\*\*END OF PAPER\*\*\*\*