



NATIONAL OPEN UNIVERSITY OF NIGERIA

University Village, Plot 91, Cadastral Zone,
Nnamdi Azikiwe Expressway, Jabi, Abuja

**FACULTY OF SCIENCES
2023_2 EXAMINATIONS**

Course Code: CIT412
Course Title: Modelling and Simulation
Time Allowed: 2.5 Hours
Credits 3
Instruction: Answer Question one (1) (22 marks) and any other four (4) (12 marks)

Questions

- 1) (a) Describe the following terms: (i) Activity (ii) System (iii) Simulation (iv) Delay (v) Model **(5marks)**
- b) Differentiate between analytical models and numerical models **(3marks)**
- c) Define congestion in a queuing system, and identify its major characteristics.
Congestion = **(3marks)**
Characteristics = **(2marks)**
- d) Explain the properties of random numbers **(6marks)**
- e) Discuss Bayesian inference **(3marks)**
- 2) (a) Clarify on Time series input model **(4marks)**
- (b) Explain the steps in simulation study **(5marks)**
- (c) Outline inventory system **(3marks)**
- 3) (a) Differentiate between terminating and non-terminating simulation **(5marks)**
- 3(b) Distinguish between endogenous and exogenous event **(3 marks)**
- 3(c) Separate between random numbers and random variates **(4 marks)**
- 4) (a) What do you understand by model verification and validation? **(3marks)**
- (b) Articulate briefly the various method of validating input model **(6marks)**
- 4c) What are the general procedure for constructing and analyzing queuing models? **(3marks)**

- 5) (a) Transcribe a short on *Cobweb model* (4marks)
(b) Converse the process of the *Selection of simulation software* (5marks)
- 5c) Conscript five Modelling Procedure (3 marks)
- 6)(a) Delineate *Manufacturing system simulation* (4marks)
- (b) Briefly designate the following concepts:
- i) Trace-driven simulation (2marks)
 - ii) Empirical distributions (3marks)
- (c) what is all about fitting (theoretical) distributions? (3marks)