



**NATIONAL OPEN UNIVERSITY OF NIGERIA  
JABI FCT ABUJA  
FACULTY OF SCIENCE  
FEBRUARY 2018 EXAMINATION**

**CIT412: Modeling and Simulation**

**TIME ALLOWED: 3Hours**

**INSTRUCTION(S): Attempt any Five (5) questions**

**Question 1**

- a) Clearly state any four purposes of simulation languages that you know - **4 marks**
- b) There are two approaches in simulation model development. Compare these approaches - **3 marks**
- c) With appropriate examples, list and discuss any 5 types of discrete simulation languages that you know - **7 marks**

**Question 2**

- a. List and explain any three types of probability sampling methods that you know -**4 marks**
- b. Explain any three control features that allow researchers to eliminate extraneous variables that affects the determination of dependent variables - **6 marks**
- c. State the three perspectives of data models and the relationship between them (**4 marks**)

**Question 3**

- a) Queuing models are generally constructed to represent the steady state of a queuing system. Enumerate the general procedure for constructing and analysing such queuing models - **4 marks**
- b) Briefly discuss the application of stochastic process in natural sciences, finance, artificial intelligence, biology and social sciences - **10 marks**

**Question 4**

- a) List and explain the three categorized levels of modeling assumptions – **4 marks**
- b) Discuss the application of Monte Carlo methods in areas such as physical sciences, telecommunication, engineering, finance and visual designs – **10 marks**

**Question 5**

- i) List and describe any five common database models that you know - **5 marks**
- ii) State Monte Carlo method algorithm - **3 marks**
- iii) Briefly describe simulation in four application areas of your choice - **6 marks**

**Question 6**

- i) List and discuss any 5 types of database models that you know - **7 marks**
- ii) Describe the procedure for the construction and analysis of queues - **7 marks**