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**