NATIONAL OPEN UNIVERSITY OF NIGERIA

14/16 AHMADU BELLO WAY, VICTORIA ISLAND, LAGOS

SCHOOL OF SCIENCE AND TECHNOLOGY

MARCH/APRIL 2014 EXAMINATION

COURSE CODE: CIT 412

COURSE TITLE: MODELLING & SIMULATION

TIME ALLOWED: 2 HOURS

INSTRUCTION:*ANSWER ANY FOUR QUESTIONS OUT OF SIX*

1. (a) Explain the following terms:

   i. Modelling
   ii. Model
   iii. Simulation

   (b) Enumerate and explain five types of Models available, outlining at least five procedures involved in modelling.

2. (a) Explain how a computer generates a sequence of random numbers, outlining other ways of Generating pseudo-random numbers.
   (b) Write a QBASIC program to simulate the tossing of a fair coin 10 times. The program displays a H when a Head appears and a T when a Tail appears.

3. (a) Briefly explain theCongruential Methods. Using the Congruential method, generateat least eight sets of random numbers, where m = 8, a = 5, c = 7 and the Seed $X_o = 4$.
   (b) Enumerate and discuss explicitly the various methods of generating random numbers; indicating the formulas applicable under each methods.

4. (a) Using suitable diagram, explain the term Visual Modelling.
   (b) Enumerate and explain five types of Models available, outlining at least five procedures involved in modelling.

5. (a) Suppose the output of the program of example 3 is: HHTHHTTTHH and that there are two players X and Y involved in the tossing of the coin. Given that player X wins N50.00 from

player Y if a head appears and loses it to player Y if a tail appears. Determine who won the
game and by how much.

(b) Outline and discuss the three perspective to a Data Model

6. (a) Explain the term Simulation and enumerate its objectives and its various types.

(b) Using suitable diagram, explain the various steps involved in the physical simulation process.