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MAIN EXAMINATION

AUGUST – DECEMBER 2017 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF BIOLOGY

REGULAR PROGRAMME

BIO 407: BIOLOGICAL MODELLING

Date: DECEMBER 2017	**Duration: 2 Hours**
INSTRUCTIONS: Answer Question ONE and any other TWO Questions	

Q1. a) Describe six types of models **(6 marks)**

b) Differentiate between Model, Modelling, Simulation and Computer model **(4 marks)**

c) Advise a science student on advantages of using a model **(3 marks)**

d) Explain how a congruential generator is used in random number generation **(5 marks)**

e) Briefly describe simulation in five application areas. **(5 marks)**

f) What are the objectives of simulation studies **(3 marks)**

g) State three applications of Monte Carlo method in mathematics **(3 marks)**

h) Differentiate inferential statistics from descriptive statistics **(1 mark)**

Q2. a) What are the steps in modelling **(7 marks)**

b) Briefly explain how a model is evaluated **(5 marks)**

c) Discuss various application of simulation and modeling in biology **(8 marks)**

Q3. a) Describe six factors considered in evaluating a model **(6 marks)**

b) Explain specific purpose of simulation languages **(8 marks)**

c) Differentiate between Bayesian from frequentist inference **(6 marks)**

Q4. a) Discuss application of monte carlo methods **(12 marks)**

b) Describe how a visual model should be **(8 marks)**

Q5. Discuss discrete and continuous simulation languages **(20 marks)**

END