MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR

SCHOOL OF SCIENCE AND INFORMATION SCIENCES
DEPARTMENT OF COMPUTING AND INFORMATION SCIENCES

FOURTH YEAR SECOND SEMESTER EXAMINATION
BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COURSE CODE: COM 426E

COURSE TITLE: SIMULATION & MODELLING

DATE: 23RD APRIL 2018   TIME: 8:30AM-10:30AM

INSTRUCTIONS TO CANDIDATES:

ANSWER ALL QUESTIONS IN SECTION A AND ANY 2 QUESTIONS IN SECTION B

SECTION A: COMPULSORY [30 MARKS]

QUESTION ONE

a) Define the following terms
   i.   Simulation   [2 marks]
   ii.   Model   [2 marks]
   iii.   System   [2 marks]
   iv.   Operating systems   [2 marks]

b) Distinguish between the following
   i.   Natural systems and Designed physical systems   [4 marks]
   ii.   Designed abstract systems and Human activity systems [4 marks]

c) Define the Monte Carlo simulation.   [2 marks]
d) Outline the selection process of simulation software   [2 marks]
e) Explain four reasons Why simulation is necessary   [8 marks]
f) Define the term variability   [2 marks]

SECTION B ATTEMP ANY TWO QUESTIONS [40 MARKS]
QUESTION TWO

   i.   Define the term Random Numbers   [1 mark]
   ii.   The design is usually documented as a set of graphical models. State any two models   [2 Marks]
   iii.   Distinguish between Dynamic complexity & Combinatorial complexity   [4 marks]
   iv.   Draw a detailed diagram of a conceptual model and explain [3 marks]

   v.   Draw a detailed diagram of the three-phase simulation approach for discrete events   [4 marks]
   vi.   Explain the Basic steps in Monte Carlo Simulation   [6 marks]

QUESTION THREE

    i.   Define the discrete event modelling.   [2 marks]

    ii.   Define the time slicing of the simulation process   [2 marks]

    iii.   Distinguish between the following:

        a) Static simulation and Dynamic simulation   [4 marks]

    iv.   Outline one disadvantages of simulations   [2 marks]

    v.   State the important properties of random numbers   [2 marks]

    vi.   Outline the FOUR Benefits of VIS (Visual Interactive Simulation)

                [4 marks]

    vii.   Distinguish between the following

        a) General purpose simulation packages & Application

           orientated simulation packages   [4 marks]

QUESTION FOUR

    i.   Discuss four areas where simulation can be applied   [8 marks]

    ii.   Explain three categories of software that can be used for performed modelling and simulation   [6 marks]

    iii.   Explain the Three advantages of simulations   [6 marks]

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