KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2019/2020 ACADEMIC YEAR
SECOND YEAR SECOND SEMESTER
MAIN EXAMINATION

FOR THE DEGREE OF BACHELOR OF COMMERCE

COURSE CODE: BCO 222

COURSE TITLE: MANAGEMENT DECISION MODEL

DATE: 19/11/2020 **TIME: 2.00 – 4.00PM**

INSTRUCTION TO CANDIDATES

1) The paper contains **FIVE** questions
2) Attempt **THREE** questions
3) Question **ONE** is Compulsory

TIME: 2 Hours

KIBU observes **ZERO** tolerance to examination cheating

QUESTION ONE

a) Management Decision Models can be applied in different functional areas of management. Discuss the areas of application of the Management Decision Models. (6marks)

b) Describe the steps followed in simulation.(6 marks)

c) Queuing Models is the study of waiting lines in Management Decision Models. Elucidate the Assumptions of Queuing models. (6 marks)

d) A construction company employs a group of Engineers and management consultants for a construction project. This group came up with time estimates for each activity as given in the table below.

ACTIVITY	IMMEDIATE PREDECESSOR	TIME ESTIMATE IN WEEKS
1-2	-	12
2-3	1-2	4
2-4	1-2	20
3-5	2-3	20
3-6	2-3	8
3-7	2-3	8
6-7	3-5, 3-6	8
4-7	2-4	8
7-8	3-7, 6-7, 4-7	12
8-9	7-8	4

Required.

i) Draw the network diagram. (9 marks)

ii) Determine the Critical activities, Critical path and the Project duration (3 marks)

QUESTION TWO

In a certain country there are two daily newspapers i.e. *Nation and the The Star.* A researcher interested in the reading habits of the population of this country found out the following;

Of the readers who read the *Nation* on a given day, 50% do so the following day while the rest change to the *The Star.* Of those who read the *The Star* on a given day, 40% change to the *Nation* the following day. Yesterday the readership were 30% *Nation* and 70% for *The Star.* Assume all conditions hold.

Required.

a) Determine the readership levels for both dailies today (5 marks)

b) Determine the readership levels tomorrow (5 marks)

c) And if this process persists long enough, what would be the eventual readership levels. (5 marks)

d) Discuss the Assumptions of Markov Chains (5 marks)

QUESTION THREE

The Eli Hotel was burned down in a fire and the manager decided to accommodate the guests in 4-person and 8- person tents. The tents were to be hired at a cost of Shs.15 and Shs.45 per night respectively. The space available could accommodate at most 13 tents and the manager had to cope with at least 64 guests.

Required

a) Formulate this as a linear programming model that could be used to determine the number of tents of each type that could be put up in order to minimize the overall cost. (5 marks)
b) Solve the problem using the graphical method. (10 marks)
c) State the steps of solving a Linear Programming Equation using Simplex Method.. (5 marks)

QUESTION FOUR

Namalwa a research assistant in Khitia Manufacturers Ltd established the following information for the sole purpose of justifying whether to continue or stop producing and selling one of their products.

Table 1

Costs (Kshs '000)	600	450	520	400	580
Probability	0.10	0.25	0.40	0.05	0.20

Table 2

Sales (Kshs '000)	700	800	600	550	640
Probability	0.15	0.20	0.30	0.02	0.33

The random numbers given below were used to estimate the costs and sales.

Costs:

45, 80, 82, 27, 72, 68, 33, 55, 02 and 92

Sales:

30, 05, 71, 73, 80, 40, 35, 91, 98 and 25

Required

Simulate the costs and sales by the use of the given random numbers and obtain the daily net profit. (20 marks)

QUESTION FIVE

A company is considering investing in one of three investment opportunities A, B and C under certain economic conditions. The payoff matrix for this situation is economic condition.

Investment opportunity	1 USD	2 USD	3 USD
A	5000	7000	3000
B	-2000	10000	6000
C	4000	4000	4000

Required.

a) Determine the Best investment opportunity using the following criteria
   i. Maximin (2 marks)
   ii. Maximax (2 marks)
   iii. Minimax regret (2 marks)
   iv. Hurwicz (alpha = 0.3) (4 marks)

b) A retailer must decide whether to build a small or a large facility at a new location. Demand at the location can be either small or large with probabilities estimated to be 0.4 and 0.6 respectively. If a small facility is built and demand proves to be high, the manager may choose not to expand (payoff =shs 223,000) or to expand (payoff = shs 270,000). If a small facility is built and demand is low, there is no reason to expand and the payoff is shs 200,000. If a large facility is built and demand proves to below, the choice is to do nothing (payoff = shs 40,000) or to stimulate demand through local advertising. The response to advertising may be either modest or sizeable, with their probabilities estimated to be 0.3 and 0.7 respectively. If it is modest, the payoff is estimated to be only shs 20,000; the payoff grows to shs 220,000 if the response is sizeable. Finally if a large facility is built and demand turns out to be high, the payoff is shs 800,000

Required
Draw a decision tree. Then analyze it to determine the expected payoffs for each decision and node. Which alternative between the small and large facility has higher expected payoff(10 marks)