KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

2021/2022 ACADEMIC YEAR
SECOND YEAR SECOND SEMESTER

MAIN EXAMINATION

FOR THE DEGREE OF BACHELOR OF COMMERCE

COURSE CODE: BCO 222

COURSE TITLE: MANAGEMENT DECISION MODELS

DATE: 05/09/2022 TIME: 9.00 – 11.00AM

INSTRUCTION TO CANDIDATES

1) The paper contains **FIVE** questions
2) Attempt **THREE** questions
3) Question **ONE** is Compulsory
4) Show your work clearly.

KIBU observes **ZERO** tolerance to examination cheating

QUESTION ONE

(a)

(i) Briefly describe the term replacement? **(2 marks)**

(ii) Examine some two important replacement situations **(4 marks)**

(iii) What is the main idea behind game theory? **(2 MARKS)**

(b) (i) Explain IRR and PbP? **(4 MARKS)**

(ii) Explain two applications of simulation model **(4 MARKS)**

(c) A calculator manufacturer decides to stop production of two models of calculator X and Y, when existing parts have been used. Stock of screws, clips and batteries are low, and the requirements for each calculator produced are as follows:

Part	No. required for X	No. required for Y	No. available
Screws	3	2	360
Clips	1	2	160
Batteries	1	1	125

Write down the constraint on X and Y **(5 MARKS)**

(d) Good schedules and sequences lead to efficient execution of manufacturing and service plans. Do you agree? Discuss **(4 MARKS)**

(e) (i) Define "Critical path" **(2 MARKS)**

(ii) Consider the project below, what is the critical path for the project? **(3 MARKS)**

QUESTION TWO

(a) The net cash flows from project "A" is as below:

Year	**0**	**1**	**2**	**3**	**4**	**5**
Net cashflow	**12000**	**4000**	**4000**	**4000**	**3500**	**3000**

Required:

Calculate the NPV for project A at a discount rate of 12%. What is your recommendation? **(10 MARKS)**

(b) A firm is considering replacement of a machine whose cost is Kes 12200 and the scrap value is Kes 200. The maintenance cost found from experience to be as follows:

Year	1	2	3	4	5	6	7	8
M/cost	200	500	800	1200	1800	2500	3200	4000

When should the machine be replaced? **(10 MARKS)**

QUESTION THREE

(a) Recall the following as used in queuing:

i) Balking **(2 MARKS)**

ii) Waiting time **(2 MARKS)**

iii) Service station **(2 MARKS)**

iv) Queuing system **(2 MARKS)**

(b) If λ=24 customers per hour arrive at checkout counter and μ=30 customers per hour can be checked out calculate:

(i) The average number of customers waiting in the waiting line **(3 MARKS)**

ii) The average waiting time per customer in the system **(3 MARKS)**

iii) The average waiting time in the line per customer **(3 MARKS)**

iv) The average number of customers in the queue system **(3 MARKS)**

QUESTION FOUR

a) Discuss game theory's role in society **(10 MARKS)**

b) Enumerate the problems that can be solved with simulation? **(10 MARKS)**

QUESTION FIVE

Joash Plc, makes two types of biscuits X1 and X2 each of which requires passing through three sections of production; mixing, heating and packing. The number of hours required to complete each process for a unit of biscuit is given below:

	Mixing	Heating	Packing
X1	120	50	150
X2	100	150	50

The hours available for each of the sections is 480 hours. If the contribution to profit of X1 is Kes 850 and X2 is Kes 800,

Find:

(i) The objective function **(4 MARKS)**

(ii) The constraint inequalities **(6 MARKS)**

(iii) The number of X1 and X2 to be produced in order to maximize profit. **(6 MARKS)**

(iv) The maximum profit **(4 MARKS)**