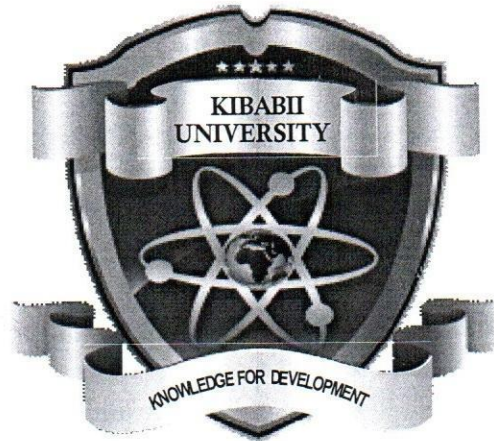


# KIBABII UNIVERSITY

152



## UNIVERSITY EXAMINATIONS

**2019/2020 ACADEMIC YEAR  
SECOND YEAR SECOND SEMESTER  
SPECIAL/SUPPLEMENTARY EXAMINATION**

**FOR THE DEGREE OF BACHELOR OF COMMERCE  
COURSE CODE: BCO 222/BCO 206/BBM 222  
COURSE TITLE: MANAGEMENT DECISION MODEL**

**DATE: 05/02/2021**

**TIME: 08.00AM-10.00AM**

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### 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) Cars arrive at some service facility (garage) at a rate of 5 cars per hour. The service rate is 8 cars per hour.
  - i. What is the probability that the server being idle (5 marks)
  - ii. What is the number of cars expected to be in the system (5 marks)
- b) Distinguish between decision making under risk and decision making under uncertainty (5 marks)
- c) Briefly compare and contrast between a Transportation problem and an assignment problem as used in linear programming (5 marks)
- d) Define what a Model is and then describe the phases of operations research.(5 marks)
- e) Linear programming is one of the models used in operations research to solve management problems. Define some of the areas in the real world that we can apply linear programming to solve problems (5 marks)

**QUESTION TWO**

2. A Company employs service Engineers based at various locations throughout the country to service and repair their equipment installed in customer's premises. Four requests for services have been received and the company finds that four Engineers are available. The distances each of the Engineers is from the various customers is summarized in the table below and the company wishes to assign engineers to the customers to minimize the total distance to be travelled.

	W	X	Y	Z
Alf	25	18	23	14
Bill	38	15	53	23
Charlie	15	17	41	30
Dave	26	28	36	29

Required

- a) Using Assignment model, assign the engineers to attain the minimum total Distance Travelled (12 marks)
- b) What is the total mileage attained in the final assignment(3 marks)
- c) Giving examples briefly discuss the applications of the Transportation model and the assignment model in the real business environment (5 marks)

**QUESTION THREE**

3. Kenest suppliers is a firm dealing with imports of books and it has stores strategically situated around the country. Yesterday received orders to supply 100 books from 4 schools. Of the books ordered the firm has 110 books in stock. The firm wishes to minimize costs and its seeking your best advice

Below is the table of availability and requirements.

	Sch. A	Sch. B	Sch. C	Sch. D	Total requirement



	Books	25	25	42	8	100
Store I	40	Sh. 3	Sh. 16	Sh. 9	Sh. 2	Transport costs per book
Store II	20	Sh. 1	Sh. 9	Sh. 3	Sh.8	
Store III	50	Sh. 4	Sh. 5	Sh. 2	Sh.5	
Total in store	110					

- a). define the following terms as used in transportation and assignment models.
- i) Dummy destination (3 marks)
  - ii) Degeneracy (3 marks)
- b). Using the transportation model determine how the books should be distributed with minimum cost. what is the minimum cost determined (14 marks)

#### QUESTION FOUR

4. A company produces inexpensive tables and chairs. The production process for each is similar in that both require a certain number of hours of carpentry work and a certain number of labour hours of in the painting department. Each table takes 4 hours of carpentry and 2 hrs in the painting shop. Each chair requires 3 hours of carpentry and 1 hour in painting. During the current production period 240 hours of carpentry time and 100 hours of painting time are available. Each table sold yields a profit of shs. 7 and each chair produced is sold for aprofit of shs. 5.

##### Required

- a). Formulate the above as a linear programming problem (10 marks)
- b). Using the graphical method the optimum number of tables and chairs that should be produced to maximize profit (10 marks)

#### QUESTION FIVE

5. The following represents the activities of a network

Activity	Preceding Activity	Duration (days)
A	-	4
B	A	7
C	A	5
D	A	6
E	B	2
F	C	3
G	E	5
H	B, F	11
I	G,H	7
J	C	4
K	D	3
L	I,J,K	4

##### Required

- a). Define the terms (5 marks)
- i)Critical Path and
  - ii)Total Float
  - iii)Free Float
- b). Draw the Network diagram and find the critical path (10 marks)
- c). Calculate the Total Floats of the network in question (5 marks)