KIBABII UNIVERSITY

UNIVERSITY EXAMINATIONS

MAIN EXAMINATION

2018/2019 ACADEMIC YEAR
SECOND YEAR SECOND SEMESTER

FOR THE DEGREE OF BACHELOR OF COMMERCE

COURSE CODE: BCO 206

COURSE TITLE: MANAGEMENT DECISION MODELS

DATE: 17/05/2019 **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.

QUESTION ONE

Comfort plus company (CPC) manufactures a standard dining chair used in restaurants. The demand forecasts for quarter one (Jan-march) and quarter two (april-june) are 3700 chairs and 4200 chairs respectively. CPC has a policy of satisfying al demand in the quarter in which it occurs

The chair contains an upholstered seat that can be produced by CPC or purchased from DAP, a subcontractor. DAP currently charges Kshs 12.50 per seat, but has announced a new price of kshs13.75 effective April 1. CPC can produce the seat at a cost of Kshs 10.25. CPC can produce up to 3800 seats per quarter.

Seats that are produced or purchased in quarter 1 and used to satisfy demand in quarter 2, cost the company kshs 1.50 each to hold in inventory, but maximum inventory cannot exceed 300 seats.

Required

a) Formulate this as a liner programming mathematical model (10 marks)
b) Management Decision Models are tools used to managers make sound decisions. Discuss the features or characteristics of Management Decision Models. (6 marks)
c) In Queuing theory customers exhibit different kinds of behaviors. Discuss the behavioural factors of customers entering Queues (6 marks)
d) Elucidate the difference between Identity dummy activities and Logic dummy activities as applied in Network analysis. (4 marks)
e) Differentiate between dummy destination and degeneracy as used in the transportation and assignment Models (4 marks)

QUESTION TWO

The newly introduced Luxury Bus Services, makes a trip from Nairobi to Bungoma that takes 6hrs by bus. A typical time table of the bus service in both directions is given below.

Route No.	Depart From Nairobi	Arrive Bungoma	Route No.	Depart Bungoma	Arrive Nairobi
`a	6.00am	12.00noon	1	5.30am	11.30hrs
`b	7.30am	13.3.pm	2	9.00am	15.00hrs
`c	11.30am	17.30hrs	3	15.00hrs	21.00hrs
`d	19.00hrs	1.00am	4	18.30hrs	00.30hrs
`e	00.30hrs	6.30am	5	00.00hrs	6.00am

The cost of providing this service by Luxury Bus Co. depends upon the *time spent by the bus crew (driver and conductor) away from their places in addition to service time.* There are five crew. There is also a constraint that every crew should be provided with more than four hours of

the new products of this kind generally have a 60% chance of success. However it is also accepted that if the results of the market research survey are favourable then the chances of success increase to 90% and if not favourable decrease to 30%. In the past 50% of market research survey of this type of new product have given favourable results

Required

a). Identify the decision alternatives and states of nature (4 marks)

b). construct the payoff table (2 marks)

c). Determine the optimal decision without market survey results using

i) EMV criterion (6 marks)

d). Construct a tree diagram to represent the decisions the manufacturer has to make taking into consideration the market survey results (8 marks)

e). Using the criterion of EMV advise the manufacturer as to the best course of action.

rest before embarking on the return trip again. and should not wait for more than 24hrs for the return trip. Luxury bus Company has residential facilities for the drivers.

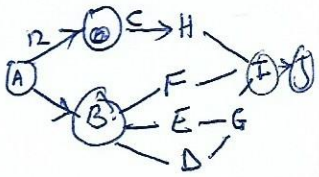
Required

a) Work out this Assignment Problem (10 marks)
b) Which service line and which crew is to be connected with which other line and which crew (5 marks)
c) What is the minimum waiting time and by which crew (5 marks)

QUESTION THREE

Tamil Nadu Electricity Board has started a project for the improvement of the power supply in their region and have identified the following activities.

Name	Activity Description	Immediate Predecessor	Time Duration (weeks)
A.	SURVEY	-	12
B.	ESTIMATE AND SANCTION	A	4
C.	TREE CUTTING SCHEDULE	A	20
D.	STUBS AND TOWER PARTS	B	20
E.	AWARD CONTRACT FOR STUB	B	8
F.	AWARD CONTRACT FOR TOWER	B	8
G.	STUB SETTING FOR TOWERS	D,E	8
H.	TREE CUTTING	C	8
I.	TOWER ERECTION & STRINGING	F,G,H	12
J.	ENERGIZING	I	4



- Mutually exclusive
Total Exhaustive

Required

a) Draw a suitable AOA network Diagram (10 marks)
b) Spell out your assumptions in designing this network (5 marks)
c) Find the estimated time to complete the transmission line project (5 marks)

QUESTION FOUR

Relax-And-Enjoy Lake Development Company is in the business of selling property for vacation and/or retreat cottages. The primary market for these lake side lots include middle and upper income families within approximately one hundred miles. Relax-and-enjoy employed an advertising firm *Gina Ltd* to design the design the promotional campaign for the project

After considering the possible advertising media and market to be covered, Gina has made the preliminary recommendations to restrict the months advertising to five sources only. At the end of this month of the month Gina will then reevaluate its strategy based upon the month's results.

Gina has collected data on the number of potential purchase families reached, the cost per advertisement, the maximum number of times each media is available and the expected exposure for each of the five media.

The expected exposure is measured in terms of an exposure unit, management judgment measure in terms of the relative value of one advertisement in each of the media.

These measures according to Gina's experience take into account such factors as audience profile (eg age, income, and education of the audience reached.), image presented, and quality of the advertisement.

The information collected to date is represented in the following table.

Advert. Media	Number of purchase families	Cost per Advert (in Kshs)	Maximum times available per month	Expected Exposure Units.
1. Day time TV (for 1 min)	1000	1500	15	65
2. Evening TV (for 30 secs)	2000	3000	10	90
3. Daily Newspaper (full page)	1500	400	25	40
4. Sunday newspaper (half page colour)	2500	1000	4	60
5. Radio (30 secs)	300	100	30	20

The advertising budget is kshs 30,000. At least ten television campaigns must be used and at least 50000 potential purchasers must be reached during the month. In addition to that, no more than kshs18000 may be spent television advertisement.

Required.

Formulate this as a linear programming mathematical model (20 marks)

QUESTION FIVE

1. A manufacturer has developed a new product and must decide whether to shelve the new product, sell the design for shs. 600,000 or manufacture the new product. If the new product is successful, then the expected profits are shs. 1.2 million and if not successful shs. 200,000. The manufacturer also needs to decide whether or not to commission a market research survey. The cost of the survey would be shs. 40,000. It is accepted by the manufacturer that