NATIONAL OPEN UNIVERSITY OF NIGERIA,
PLOT 91 CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI – ABUJA
FACULTY OF SCIENCES
MARCH 2018 EXAMINATION

COURSE CODE: CIT 425
COURSE CREDIT: 3
COURSE TITLE: OPERATIONS RESEARCH
TIME ALLOWED: 3 HOURS
INSTRUCTION: ANSWER QUESTION 1 AND ANY OTHER FOUR (4) QUESTIONS

QUESTION

1a. Generally, the solution procedure is to model optimisation problems by means of a mathematical program and then solve the program. Outline the steps recommended for transforming a word problem into a mathematical program. (6 marks) .

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1b. Linear programming is said to be critical in Operations Research. Name and explain five (5) fields where linear programming is applicable. (15 Marks)

1c. State what data collection entails. (1 Mark)

[Total = 22 marks]

2a. With the aid of a well-labelled flow chart, outline the stages in operation research (9 marks)

2b. Explain the concept of the implementation of a model. (3 marks)

[Total = 12 marks]

3a. Give a short account of the following models:

I. Iconic models

I. Analog models **) 3 marks each**

I. Deterministic models .

[Total = 12 marks] I. Stochastic models

4. A farmer has 100 acres on which to plant two crops: corn or wheat. To produce these crops, there are certain expenses as shown in the table

Item	Cost per Acre (#)
Corn	
Seed	12
Fertilizer	58
Planting/care/harvesting	50
Total	120
Wheat	
Seed	40
Fertilizer	80
Planting/care/harvesting	90
Total	210

After the harvest, the farmer must store the crops awaiting proper market conditions. Each acre yields an average of 110 bushels of corn or 30 bushels of wheat. The limitations of resources are as follows: Available capital: N15,000 .Available storage facilities: 4,000 bushels.If net profit (the profit after all expenses have been subtracted) per bushel of corn is N 1.30 and for wheat is N 2.00 , how should the farmer plant the 100 acres to maximize the profits? **(12 marks)**5a. There are a number of facts about the concept of operations research. Write down any four (4) of these facts. (4 marks)5b. Outline any four (4) limitations of operations research (4 marks). 6a. Name and explain two types of integer programming (6 marks). 6b. Write down two ways in which dynamic programming is distinct from linear programming (6 Marks) **[Total = 12 marks]**