NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF SOCIAL SCIENCES
DEPARTMENT OF ECONOMICS

2019_1 EXAMINATION

COURSE TITLE: **OPEARATIONS RESEARCH**
COURSE CODE: **ECO314**
UNITS: **2**
TIME ALLOWED: **2HOURS**

INSTRUCTION: **ANSWER THREE (3) QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS. ONE MARK FOR CLARITY AND GOOD PRESENTATION**

QUESTION ONE
(a). What is linear programming? **(4marks)**
(b). Mention five areas of applications of operations research **(10 marks).**
(c). Identify any three main conditions that have to be satisfied before linear programming can be used for optimization problems **(9 marks).**
TOTAL MARKS = (23)

QUESTION TWO
(a). A company produces two varieties of a product. Variety **A** has a profit per unit of N2.00 and variety **B** has a profit per unit of N3.00. Demand for variety **A** is at most four units per day. Production constraints are such that at most 10 hours can be worked per day. One unit of variety **A** takes one hour to produce but one unit of variety **B** takes two hours to produce. Ten square metres of space is available to store one day's production and one unit of variety **A** requires two square metres whilst one unit of variety **B** requires one square metre. Formulate the problem of deciding how much to produce per day as a linear program and solve for it graphically. **(10marks)**
(b). Succinctly state and explain the five assumptions of linear programming. **(13 marks)**
TOTAL MARKS = 23

QUESTION THREE
(a) What is a transport model? (**4 marks)**
(b) Identify and discuss the assumptions of the transport model **(9 marks)**
(c). Solution of transportation problem comes up in two phases, identify the phases and state the methods that can be used in the first phase **(10 marks)**
TOTAL MARKS = 23

QUESTION FOUR

(a) Define Decision Tree. **(7 marks)**

(b).What are the need for Decision Tree Diagram? **(7 marks)**

(c). List out the Advantages of Decision Trees. **(9 marks)**

TOTAL MARKS = 23

QUESTION FIVE

Suppose the table below gives us the supply of cows from three sources in the north and the demands by three locations in the southern part of Nigeria. The quantities inside the cell represent the unit costs (in naira) of transporting one cow from one source to one location.

Sources	Lagos	Akure	Awka	Supply
Sokoto	90	85	70	600
Kano	175	110	95	1400
Maiduguri	205	190	130	1000
Demand	1600	1050	350	

Use the North West Corner method to allocate the cows in such a way as to minimize the cost of transportation and find the minimum cost. **(23 marks)**

TOTAL MARKS = 23