



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**FACULTY OF SOCIAL SCIENCES**  
**DEPARTMENT OF ECONOMICS**  
**2024 1 EXAMINATION**

**COURSE TITLE:** OPERATIONS RESEARCH  
**COURSE CODE:** ECO 314  
**CREDIT UNITS:** 3 UNITS  
**TIME ALLOWED:** 3 HOURS  
**INSTRUCTION:** ANSWER ANY FOUR (4) QUESTIONS

**QUESTION ONE**

1a. what are the similarities between Transportation Problem and Assignment Problem  
(6 marks)

1b. Chucks Nigeria Limited received supplied from Abuja, Kaduna and Jos, and are determined in Port-Harcourt, Lagos and Enugu. The table below shows the unit cost of moving the items from one destination to another.

	Port-Harcourt	Lagos	Enugu	Supply
Abuja	80	70	60	500
Kaduna	125	150	85	1200
Jos	180	140	90	800
Demand	1300	850	350	

Use the information above to

- Construct the transportation model using the Least Cost Method
- Determine the minimum cost involved in transporting the items to destinations
- Summarize the minimum cost in a tabular form.

(11.5 marks)

**QUESTION TWO**

2a. Application of simulation is versatile and mostly used in problem solving. Discuss  
(7.5 marks)

2b. Discuss the steps involve in analysing Monte Carlo Simulation  
(10 marks)

**QUESTION THREE**

3. Assuming nine (9) labourers are employed to work in a rice farm. The labour time and due dates for the work are given below: Determine the sequence according to Earliest Due Date (EDD) and Longest Processing Time (LPT). Compare the sequence with best options

Workers	Processing Time	Work due date
A	2	3
B	1	2
C	4	10
D	3	5
E	4	7
F	5	12
G	6	8
H	4	13
I	7	9

From the information above, calculate the

- i. Average flow time
- ii. Average number of workers in the system
- iii. Average work lateness in site
- iv. Utilisation of the workers.

(17.5 marks)

**QUESTION FOUR**

4. A system has many interfaces with its environment. Critically discuss the forms of a system in line with real life application

(17.5 marks)

**QUESTION FIVE**

5a. Discuss four (4) of the assumptions of game theory

(6 marks)

5b. Use the information in the payoff matrix below for player A and player B to calculate

(11.5 marks)

$$\begin{matrix} & \text{B} \\ \text{A} & \begin{bmatrix} 6 & 3 \\ 4 & 5 \end{bmatrix} \end{matrix}$$

- i. If saddle point exist or not
- ii. The average value of the game
- iii. Determine the optimum strategy for player A and player B.

(11.5 marks)