



NATIONAL OPEN UNIVERSITY OF NIGERIA

Plot 91, University Village Cadastral Zone, Nnamdi Azikiwe Express Way, Jabi-Abuja.

FACULTY OF COMPUTING

DEPARTMENT OF COMPUTER SCIENCE

2024 1 EXAMINATION

Course Code: CIT756

Course Title: OPERATIONS RESEARCH

Credit Unit: 2 units

Instruction: Answer question ONE and any other two (2) questions **Time:** 2hrs

- 1a. Operations Research is most fundamentally science-based. State the facts about Operations Research. **[5 marks]**
- b. Enumerate the scientific approach adopted in the implementation of Operations Research **[5 marks]**
- c. A convalescent hospital wishes to provide at a minimum cost, a diet that has a minimum of 200g of carbohydrates, 100g of protein and 120g of fats per day. These requirements can be met with two foods:

Food	Carbohydrate	Protein	Fats
A	10g	2g	3g
B	5g	5g	4g

If food A cost 29k per ounce and food B cost 15k per ounce, how many ounces of each food should be purchased for each patient per day in order to meet the minimum requirements at the lowest cost. Formulate the required Linear Programming model. **[20 marks]**

- 2a. A bank plans to open a single server drive-in banking facility at a particular centre. It is estimated that 28 customers will arrive each hour on an average. If on an average, it requires 2 minutes to process a customer's transaction, determine
- The probability of time that the system will be idle
 - On the average how long the customer will have to wait before receiving the server.
 - The length of the drive way required to accommodate all the arrivals. On the average 20 feet of drive way is required for each car that is waiting for service. **[10 marks]**
- b. A large transport fleet employs vehicle repairman on daily basis. The vehicle breaks down at an average rate of 4 per hour and the breakdown follows Poisson's