



NATIONAL OPEN UNIVERSITY OF NIGERIA
Plot 91, Cadastral Zone, Nnamdi Azikiwe Express Way, Jabi - Abuja
FACULTY OF MANAGEMENT SCIENCES
DEPARTMENT OF BUSINESS ADMINISTRATION
2024 1 EXAMINATION

Course Code: BUS800

Course Title: Qualitative Techniques

Time Allowed: 2hrs

INSTRUCTIONS: Attempt three (3) questions from the following four (4) questions. Question one (1) is compulsory. Question One carry 30 marks while the others carry 20 marks each.

1a. A plant manufactures washing machines and dryers. The major manufacturing departments are the stamping department, motor and transmission department and assembly department. The first two departments produce parts for both the products while the assembly lines are different for the two products. The monthly dept. capacities are

Stamping dept.: 4,000 washers or 4,000 dryers

Motor and transmission dept.: 2,400 washers or 9,000 dryers

Washer assembly line: 24,000 washers only

Dryer assembly line: 16,000 dryers only.

Profits per piece of washers and dryers are ₦2600 and ₦4000 respectively.

Formulate the Linear Programming model. **(10 Marks)**

1b. Prove that $B - A$ is a subset of A' **(10 Marks)**

1c. Dan Baba is a retail trader across the street, he stocks heavy (2B), medium (HB), fine (2H) and extra fine (3H) pencils which come in packs of 50. Currently in stock are 20 packs of 9H, 32 packs of 2H, 17 packs of HB and 26 packs of 2B. If a pack of pencil is chosen at random for inspection, what is the probability that they are: (a) medium (b) heavy (c) not very fine (d) neither heavy nor medium? **(10 Marks)**

2a. An ice-cream salesman divides his days into Sunny, Medium or Cold. He estimates that the probability of a sunny day is 0.1 and that 45% of his days are cold. He has also calculated that his average revenue on the three types of days is N1250, N1650, and N490 respectively. If his average total cost per day is N800, calculate his expected profit per day. **(10 Marks)**

2b. Which word is different from each other, and why: (i) empty, (ii) void, (iii) zero, (iv) null? **(5 Marks)**

2c. The sets $(A - B)$, $A \cap B$ and $(B - A)$ are mutually disjoint. Why? Explain. **(5 Marks)**

3a. Define operations research and trace its historical development according to Gupta and Hira (2012).

3b. A dairy firm has two milk plants with daily milk production of 9 million litres and 11 million litres respectively. Each day the firm must fulfil the needs of its three distribution centres which have milk requirement of 12, 22 and 30 million litres respectively. Cost of shipping one million litres of milk from each plant to each distribution centre is given, in hundreds of naira below. Formulate the L.P model to minimize the transportation cost.

		Distribution Centres			
Supply	1	2	3		
	12	23	41	6	
	10	19	26		
Plants	67	40	39	9	
				Demand	(20 Marks)

4a. Explain the terms below as it relates to game theory:

- | | |
|------------------------------------|---------------------------|
| I. Player | VI. Decision: |
| II. Moves | VII. Conflict: |
| III. Decision maker | VIII. Perfect information |
| IV. Objective | IX. Payoffs. |
| V. Behaviour | |
| X. Zero-sum Game (10 Marks) | |

4b. What are the purposes of maintaining inventory and the objectives of inventory cost control in an organisation. **(10 Marks)**