



NATIONAL OPEN UNIVERSITY OF NIGERIA
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI, ABUJA
FACULTY OF MANAGEMENT SCIENCES
2023_1 POP EXAMINATION

CREDIT UNIT: 2

COURSE CODE: BUS729

COURSE TITLE: Business Mathematics

TIME ALLOWED: 2hrs

INSTRUCTIONS: 1. Attempt question number one (1) and any other (2) questions.
2. Question number 1 carries 30 marks, while the other two (2) questions carry 20 marks each.
3. Present all your points in coherent and orderly manner.

1a. The purchasing department of a big company has analysed the number of orders placed by each of the 5 departments in the company by type as follows:

Departmental Orders

Type of Order	Department					Total
	Sales	Purchasing	Production	Accounts	Maintenance	
Consumables	10	12	4	8	4	38
Equipment	1	3	9	1	1	15
Special	0	0	4	1	2	7
Total	11	15	17	10	7	60

An error has been found in one of these orders. What is the probability that the incorrect order:

- came from maintenance? **2½Marks**
- came from production? **2½Marks**
- came from maintenance or production? **2½Marks**
- came from neither maintenance nor production? **2½Marks**

1b. Explain the requirements for Linear Programming 10Marks

1c. State in words and then write in tabular form

i. $A = \{x \mid x^2 = 4^2\}$ **2½Marks**

ii. $B = \{x \mid x - 2 = 5\}$ **2½Marks**

iii. $C = \{x \mid x \text{ is positive, } x \text{ is negative}\}$ **2½Marks**

iv. $D = \{x \mid x \text{ is a letter in the word correct}\}$ **2½Marks**

2a. What do you understand by Cash flows 5Marks

2b. Discuss measures to manage cash flow 15Marks

3a. The current ratio of any business organization is the ratio of its current assets to its current liabilities. The Managing Director of ACE Equipment Co. has decided to obtain a short-term loan to build up inventory. The company has current assets of N350,000 and current liabilities of N80,000. How much can the Managing Director borrow if the company's current ratio must be not less than 2.5? **15Marks**

3b. A display of 15 T-shirts in a Sports shop contains three different sizes: small, medium and large. Out of the 15 T-shirts:

3 are small

6 are medium

6 are large.

If two T-shirts are randomly selected from the T-shirts, what is the probability of selecting both a small T-shirt and a large T-shirt, the first not being replaced before the second is selected?

5Marks

4a. Write short notes on the followings

i. Joint Probability Table **3Marks**

ii. Marginal Probabilities **3Marks**

iii. Conditional Probability **3Marks**

iv. Bayes theorem **3Marks**

v. Mutually exclusive **3Marks**

4b. Explain theoretical probability **5Marks**

5a. Assume there is a drug store with 10 antibiotic capsules of which 6 capsules are effective and 4 are defective. What is the probability of purchasing the effective capsules from the drug store?

10Marks

5b. A company wishes to spend #40000 for new equipment and decide to set up a sinking fund to accumulate this money over a 3 years' period. If payments are to be made to the fund quarterly, with interest compounded quarterly at an annual rate of 5%, how large should the payments be?

10Marks