



NATIONAL OPEN UNIVERSITY OF NIGERIA  
PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI, ABUJA  
FACULTY OF MANAGEMENT SCIENCES  
2019\_2 EXAMINATION

**COURSE CODE: BUS729**

**CREDIT UNIT: 2**

**COURSE TITLE: BUSINESS MATHEMATICS**

**TIME ALLOWED: 2Hours**

**INSTRUCTIONS:**

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

**1a. What do you understand by Cash flows 7marks**

**b. A company wishes to spend #40000 for new equipment and decides to set up a sinking fund to accumulate this money over a 3 year 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**

**c. Nestle purchasing department has analysed the number of orders placed by each of the 5 departments in the company by type as follows: 13marks**

#### **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:

a) came from maintenance?

- b) came from production?
- c) came from maintenance or production?
- d) came from neither maintenance nor production?

**2a.** Let  $A = \{1,2,3,4\}$ ,  $B = \{2,4,6,8\}$  and  $C = \{3,4,5,6\}$ . Find the set;

- (i)  $A \cup B$       **2½marks**
- (ii)  $A \cap C$       **2½marks**
- (iii)  $B \cup C$       **2½marks**
- (iv)  $B \cap B$       **2½marks**

**b.** Briefly discuss the areas of application of Linear Programming      **10marks**

**3a.** Suppose you invest #2000 at an annual interest rate of 6%. Find your balance at the end of 1<sup>st</sup> year if interest is compounded; a) Yearly b) Semiannually c) Quarterly d) Monthly  
**10marks**

**b.** Discuss the following;

- i. Immediate Annuities      **2½marks**
- ii. Deferred Annuities      **2½marks**
- iii. Fixed Annuities      **2½marks**
- iv. Variable Annuities      **2½marks**

**4a.** Enumerate how cash flow can be calculated with operating, investing and financial flow.  
**10marks**

**b.** Identify and discuss five (5) limitations of linear programming.      **10marks**

**5.** Suppose a factory manager is setting up a production schedule for two models, A and B, of a new product. Model A requires 4 units of labour input and 9 units of capital input. Model B requires 5 units of labour input and 14 units of capital input. The total available labour input for the production of the product is 335 man- hours per day, and that of capital is 850 units per day. How many of each model should the manager plan to make each day so that all the available labour hours and capital inputs are used.      **20mark**