



NATIONAL OPEN UNIVERSITY OF NIGERIA
FACULTY OF MANAGEMENT SCIENCES
DEPARTMENT OF BUSINESS ADMINISTRATION
2024 1 EXAMINATION

COURSE CODE: BUS729
COURSE TITLE: Business Mathematics
TIME ALLOWED: 2Hrs
NO OF UNITS: 2 Units
INSTRUCTION: Attempt question ONE and any two (2) questions of your choice. Question 1 carries **30 Mark** while others carry **20 Marks**.

Question One

1A. 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? **15 marks**

1B. The MD of XYZ 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? **15 mark**

Question Two

2A. Identify and discuss five assumptions of linear programming. **10 marks**

2B. i. Discuss the difference between finite and infinite sets by making reference to the following sets below. **5 marks**

a. The months of the year

b. {1, 2, 3, 99, 100}

c. The people living on the earth

d. {x | x is even}

e. {1, 2, 3,.....}

ii. Suppose f is a linear function with slope of 2 and $f(4) = 8$, find $f(x)$. **5 marks**

Question Three

3A. Solve for X and Y in the system of equations: **12 marks**

$$3X - 4Y = 13$$

$$3Y + 2X = 3$$

3B. Investors prefer bonds and debentures backed by sinking funds because there is less risk of a default. Describe the various ways sinking fund may operate. **8 marks**

Question Four

4A. Find $\int \sin^2 x \cos^2 x \, dx$ **10 marks**

4B. Explain the following terms: **10 marks**

- i. Sinking Fund
- ii. Annuity

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