



NATIONAL OPEN UNIVERSITY OF NIGERIA
91, Cadastral Zone, Nnamdi Azikiwe Express Way, Jabi-Abuja
FACULTY OF MANAGEMENT SCIENCES
2021_2 EXAMINATION 45678

Course Code: BUS729

Course Title: Business Mathematics

Credit Unit: 2

Instructions:

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

Time Allowed: 2 Hours

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

1. $A = \{x \mid x^2 = 4^2\}$

2. $B = \{x \mid x - 2 = 5\}$

3. $C = \{x \mid x \text{ is positive, } x \text{ is negative}\}$

4. $D = \{x \mid x \text{ is a letter in the word —correctll}\}$ **4marks**

1aii. Identify the following sets:

1. Let A be the set of people in the world who are older than 200 years.

2. Let $B = \{x \mid x^2 = 4, x \text{ is odd}\}$,

3. If sets A and B have no elements in common

4. The family of all the subsets of any set S is called

4marks

1aiii

1. With the aid of diagram(s), show if a A and B are not comparable and if they are disjointed.

2. Let $A = \{a, b, c, d\}$ and $B = \{c, d, e, f\}$. Then illustrate these sets with a Venn diagram.

3 The sets A and B are said to be equal, when

4 The set of human population of the world is known as **6marks**

1b. write notes on the following:

i. Union set

ii. Intersection of sets

iii. Difference

iv. Compliment **4marks**

1ci. What are the Properties of Intervals

1cii. Let $A = \{1,2,3,4\}$, $B = \{2,4,6,8\}$ and $C = \{3,4,5,6\}$. Find (i) $(A \cup B) \cup C$, (ii) $A \cup (B \cup C)$.
(iii) $B \cup B$ (iv) $A \cup C$, **4marks**

1d. Write notes on the following:

i. Integers

ii. Rational numbers

iii. Natural numbers

iv. Irrational numbers **4marks**

1e. Outline the various assumptions of linear programming model **4marks**

2a. Explain and give examples of the following functions

i. Constant function

ii. Identity function

iii. Product function

iv. Onto (Subjective) function **4marks**

2bi. Explain the difference between Ordinary Annuity and Annuity Due. **2marks**

2bii. Let's assume that you are receiving \$1,000 every year for the next five years, and you invested each payment at 5%. How much would have been accrued at the end of the five-year period.

3marks

2biii. if the \$1,000 was invested on January 1 rather than December 31 each year, the last payment before we value our investment at the end of five years (on December 31) would have been made a year prior (January 1) rather than the same day on which it is valued. Using the same interest rate and

period in 2bii, calculate the future value of annuity.

3marks

2ci. what are the different types of annuities. **2marks**

2cii. Explain the several distinctive features of variable annuities. **3marks**

2ciii. Hammett, Inc. has sales of #19,570, cost of #9460, depreciation expense of #2,130, and interest expense of #1620. If the tax rate is 35 percent, what is the operating cash flow? **3marks**

3a. Explain the following in the process managing your cash-flow.

i. Measuring Cash Flow

ii. Improving Receivables

iii. Managing Payables

iv. Surviving Shortfalls **4 marks each**

3b Define sinking fund and explain various types of sinking fund. **4 marks**

4a. With appropriate example, illustrate the process of Bond pricing and its yield. **4 marks**

4bi. Explain the benefits of linear programming model. **4marks**

4bii. What are the limitations of linear programming model **4marks**

4c. A plant manufactures washing machines and dryers. The major manufacturing departments are the stamping department, motor and transmission deptt. and assembly deptt. The first two departments produce parts for both the products while the assembly lines are different for the two products. The monthly deptt. capacities are;

Stamping deptt. : 1,000 washers or 1,000 dryers

Motor and transmission deptt. : 1,600 washers or 7,000 dryers

Washer assembly line: 9,000 washers only

Dryer assembly line : 5,000 dryers only.

Profits per piece of washers and dryers are #270 and #300 respectively. Formulate the L.P model. **4marks**