



**NATIONAL OPEN UNIVERSITY OF NIGERIA**  
**PLOT 91, CADASTRAL ZONE, NNAMDI AZIKIWE EXPRESSWAY, JABI, ABUJA**  
**FACULTY OF MANAGEMENT SCIENCES**  
**2020\_1 EXAMINATION**

**COURSE CODE: BUS729**

**CREDIT UNIT: 2**

**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.** Assume that you are receiving N1,000 every year for the next five years, and you invested each payment at 5%. Calculate the future value of the annuity at the end of the five-year period.

**10Marks**

**1b.** Discuss several distinctive features of variable annuities.

**10Marks**

**1c.** Let  $A = \{1,2,3,4\}$ ,  $B = \{2,4,6,8\}$  and  $C = \{3,4,5,6\}$ .

Find (i)  $(A \cup B) \cap C$ , (ii)  $A \cup (B \cap C)$ .

**10Marks**

**2a.** Discuss the following;

i. Immediate Annuities **2Marks**

ii. Deferred Annuities **2Marks**

iii. Fixed Annuities **2Marks**

iv. Variable Annuities **2Marks**

v. Ordinary Annuity **2Marks**

**2b.** Suppose you invest N2000 at an annual interest rate of 6%. Find your balance at the end of 1<sup>st</sup> year if interest is compounded ;( i) Yearly ( ii) Semiannually (iii) Quarterly (iv) Monthly

**10Marks**

**3a.** Enumerate how cash flow can be classified with operating, investing and financial flow.

**10marks**

**3b.** A wholesaler stocks heavy (2B), medium (HB), fine (2H) and extra fine (3H) pencils which come in packs of 10. Currently in stock are 2 packs of 3H, 14 packs of 2H, 35 packs of HB and 8 packs of 2B. If a pack of pencil is chosen at random for inspection, what is the probability that they are:

(i) medium (ii) heavy (iii) not very fine (iv) neither heavy nor medium?

**10Marks**

**4a.** Write notes with examples on the followings

i. Equality of Sets      **2Marks**

ii. Sub-Sets      **2Marks**

iii. Disjoint Sets      **2Marks**

iv. Universal Set      **2Marks**

v. Null Set      **2Marks**

**4b.** State, with simple examples, the four laws of probability.      **10Marks**

**5a.** Identify and discuss five assumptions of linear programming.      **10Marks**

**5bi.** The present value of a 5year annuity with nominal annual interest rate 12% and monthly payments of N100 is:      **5Marks**

**ii.** The final value of a 7year annuity-due with nominal annual interest rate 9% and monthly payments of N100:      **5Marks**