Business Mathematics 2
7020

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

Technical and Vocational Education Examinations

JUNE XXXX **ADVANCED LEVEL**

Specialty Name (Specialty Code)	
Subject Title	**Business Mathematics**
Paper No.	**2**
Subject Code No.	**7020**

Three hours

INSTRUCTIONS TO CANDIDATES

Answer **QUESTION ONE** and **SIX** others. The mark allocation per question is indicated

You are reminded of the necessity for good English and orderly presentation in your answers.

Show all steps in your calculation, giving the answer at each stage

Use calculators, statistical formulae and financial tables were appropriate

You will be provided with graph paper(s) where necessary

You are advised to read carefully through the question paper, before you begin your answers.

1.

A business undertakes an investment with a minimum expected rate of return of 17% per year. The proposed cash flow is:

Year	0	1	2	3	4
Cash flow (FCFA)	(100,000)	36,000	50,000	40,000	20,000

a) Calculate the Net Present Value (NPV) of the project if the cost of capital is 15% and 20% **(8 marks)**

b) Use the NPV calculated in "a" to estimate the Internal Rate of Return (IRR) **(6 marks)**

c) Recommend whether the project should be undertaken based on the IRR **(2 marks)**

(Total = 16 marks)

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2. A mother shares a sum of 1,500,000FCFA among his three children; A, B and C aged on the day of sharing 12, 13, and 16 years respectively. The sharing is made such that each child receives the same amount at the age of 18years. If the compound interest rate is 7.5%, how much will each child receive?

(Total = 14 marks)

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3. Numun PLC issued a debenture loan with the following characteristics:

- Number of debentures: 1000 debentures
- Nominal interest rate: 10.5%
- Nominal value: 10,000FCFA
- Redemption price: 10,500FCFA
- Maturity date: 18 years

a) Calculate the following:

i) The interest coupon **(2 marks)**

ii) The real rate **(2 marks)**

iii) The first amortization **(3 marks)**

iv) The constant annuity **(3 marks)**

b) Present the first two lines of the amortization schedule **(4 marks)**

(Total = 14 marks)

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4. The issue capital of Ibu and Son's company is made up of 20% preference shares of 5,000FCFA each and 4,000FCFA ordinary shares all fully paid. The following data for Ibu & Son is related to 2018:

- Profits 20,000,000FCFA
- Brought forward from 2017 10,000,000FCFA
- Ordinary dividend at 20% 4,000,000FCFA
- Preference share dividend 6,000,000FCFA

Calculate:

a) The balance carried forward to 2019 **(4 marks)**

b) The total capital of Ibu and Son **(5 marks)**

c) The number of ordinary shares and preference shares issued **(5 marks)**

(Total = 14 marks)

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5. Manyi and sons PLC produces 2 products, X and Y using labour which is limited to 40,000hours per annum. It wishes to maximise contribution from its activity. The information on X and Y is presented below:

	Product X	Product Y
Labour/Unit	10	20
Selling price/unit	160	200
Variable cost/unit	100	100

The company can sell any number of product Y, but Product X is restricted to a maximum demand of 3,000units

Required:

a) Determine the contribution per unit for each product **(4 marks)**

b) Formulate the Linear Programming Model **(5 marks)**

c) Determine the optimum point (use graph). Identify the feasible region **(5 marks)**

(Total = 14 marks)

6.

a) A farmer bought an equipment listed at 8,000,000FCFA on the hire purchase scheme. He made a down payment of one quarter of the agreed price and the rest by 10 monthly payments. If the interest rate of 8% p.a. is charged, what is the value of each installment? **(8 marks)**

b) What is the average due date of a series of 30 constant annuities of 10,000FCFA each, at the annual compound interest rate of 10.25%. **(6 marks)**

(Total = 14 marks)

7. A man wants to buy a plot to build a house costing 5,000,000FCFA. He decides to open a saving account where he makes annual deposits of 886,982FCFA each year. The first deposit is made one year after the decision.
   a) What is the yearly rate that will enable him to obtain an amount required at the end of 5 years? **(5 marks)**
   b) Because of financial constraints, instead of 5 deposits, he made a total of 7 deposits; calculate the yearly deposit which will enable him to obtain the same amount after 7 years. **(5 marks)**
   c) Calculate the equivalent semester rate and equivalent quarterly rate **(4 marks)**

   (Total = 14 marks)

8. An ordinary loan is to be reimbursed by 12 constant annuities. Let A be the amortizations. You are given the following information:
   A1 + A2 = 67,576.1
   A2 + A3 = 72,644.3
   Calculate:
   a) The interest rate
   b) The first and last amortizations
   c) The constant annuity
   d) The capital borrowed **(4x3.5 marks = 14 marks)**

   (Total = 14 marks)

9. A sum of 100,000FCFA is invested at 8% simple interest per year.
   a) Calculate the total interest earned at the end of; year 1, Year 2, Year 3 and Year 4. **(6 marks)**
   b) Does the interest earned in "a" follow an AP? Justify your answer **(4 marks)**
   c) Based on the answer in "b" above, find the interest earned at the end of 30 years **(4 marks)**

   (Total = 14 marks)

10. Tamon PLC gives the following information concerning a loan contracted in February N from a credit establishment:

Amount: 16,000,000FCFA — Interest Rate: 12% p.a.
Period: 10 years — Yearly payment:
Date: 01/02/N
1st Instalment: 01/02/N+1 — REDEMPTION — CONSTANT PAYMENT

Period	Date of Payment	Due at date	Interest	Amortisation	Annuity
1					
2					

   a) Compute the constant annuity **(4 marks)**
   b) Complete line 1 and 2 of the table above **(6 marks)**
   c) Calculate the amount of the last amortization **(4 marks)**

   (Total = 14 marks)