BUSINESS MATHEMATICS 2
7073

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate of Education Examination

JUNE 2018   ADVANCED LEVEL

Subject Title	Business Mathematics
Paper No.	2
Subject Code No.	7073

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 calculations, giving the answer at each stage.

Use calculators, statistical formulae and financial tables where appropriate.

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

Turn Over

2

1. SOREDIS Co. Ltd is considering a project to purchase some equipment which would have the following cash flows:

Year	Cash flow (CFAF)
0	(5,000,000)
1	1,800,000
2	2,500,000
3	1,500,000
4	1,000,000

The estimated trade-in-value of the equipment is 200,000 CFAF.

Calculate:

(a)   The net present value (NPV) of the project   **(6 marks)**
      (i)   16% cost of capital   **(6 marks)**
      (ii)   20% cost of capital

(b)   The internal rate of return (IRR).   **(4 marks)**
                                   (Total = 16 marks)

2. The first amortization of a loan repayable by 12 constant annuities is 704,621 CFAF. Given that the eleventh amortization is 946,951.40 CFAF, calculate:

(a)   the interest rate of the loan.   **(5 marks)**
(b)   the constant annuity.   **(3 marks)**
(c)   the last amortization.   **(3 marks)**
(d)   the amount of the loan (round up your answer to the nearest thousand).   **(3 marks)**
                                   (Total = 14 marks)

3. (a)   A financial obligation requires the payment of 200,000 FCFA in 2 years, 300,000 CFAF in 5 years and 500,000 CFAF in 8 years. When can the obligation be discharged by a single payment equal to the sum of the required payment if money is worth 9% compounded annually?   **(8 marks)**

(b)   Determine the effective rate of interest corresponding to 9% per annum compounded:
      (i)   monthly   **(2 marks)**
      (ii)   quarterly   **(2 marks)**
      (iii)   semi-annually   **(2 marks)**
                                   (Total = 14 marks)

4. MONIMAN issued 3,000 debentures of 10,000 CFAF face value, with the following conditions:
    -     The debentures are redeemed at 12,000 CFAF.
    -     The rate of interest is 6% P.A.
    -     The annuities are appreciably constant.
    -     All debentures must be redeemed in 15 years through annual draws.

(a)   Calculate the amount of the constant annuity.   **(5 marks)**
(b)   Calculate the number of debentures outstanding after the 10th draw.   **(5 marks)**
                                   (Total = 14 marks)

5. NYANGO carried out a series of banking operations in Arithmetic progression. The sum of the first 3 terms of the operation is 150,000 CFAF and the first term is 4 times the third term.

(a)   Calculate the first term and the common difference.   **(7 marks)**
(b)   The value of the fifth term.   **(3 marks)**
(c)   The sum of the first 10 terms.   **(4 marks)**
                                   (Total = 14 marks)

6. (a) CHIOMA wants to buy an equipment worth 30,000,000 CFAF with the following conditions:
- 10,000,000 CFAF down payment.
- The balance in 12 equal annuities at the end of each year at 6% p.a. compound interest. (8 marks)
Calculate the annuity.

(b) A trader saves 40,000,000 CFAF every beginning of year for 6 years when the interest rate is 7.5% P.A. (6 marks)
Determine the total future value of all these investments.
(Total = 14 marks)

7. A sum of 120,000 FCFA is deposited on the 01/01/2010 at compound interest.
(a) Calculate the future value on the 31st December 2014 given that the yearly interest rates had been 7% in 2010, 8.5% in 2011, 9% in 2012, 9.5% in 2013 and 10% in 2014. (7 marks)

(b) What would have been the future value if the interest rate was:
(i) The arithmetic mean of the above rates? (3 marks)
(ii) The geometric mean of the above rates? (4 marks)
(Total = 14 marks)

8. The amortization schedule of an ordinary loan payable by constant annuities shows:
- Interest paid the second to the last year is 1,025,000CFAF
- Interest paid the last year is 525,000 CFAF
The difference between the interest paid at the end of the first period and that of the second period is 338,420 CFAF.

Determine:
(a) The interest rate of the loan. (4 marks)
(b) The last amortization. (2 marks)
(c) The constant annuity. (2 marks)
(d) The first amortization. (3 marks)
(e) The number of annuities. (3 marks)
(Total = 14 marks)

9. Mr. GoodLuck bought a machine listed at 750,000 CFAF on the hire purchase system and paid cash one fifth of this listed price. He agreed to pay the reminder by 12 equal monthly installments of 54,875 FCFA each. What was the rate of the interest charged in this arrangement? (14 marks)

10. A manufacturing firm produces two products TIC and TAC. The requirement for labour and materials for production of the two products as well as the resources available are given as follows:

Resources	Resource Requirement		Total Available Resources
	Product TIC	Product TAC	
Labour	2 hours/unit	4 hours/unit	80 hours
Materials	3 kg/unit	1 kg/unit	60 kg

The labour cost and material cost per unit are 50 francs and 60 francs respectively. TIC and TAC sales for 380 francs per unit respectively.

(a) Determine the contribution per unit for each product. (4 marks)
(b) Determine the optimal production that will maximize contribution subject to the available limited resources. (10 marks)
(Total = 14 marks)