BUSINESS MATHEMATICS
7073

CAMEROON GENERAL CERTIFICATE OF EDUCATION BOARD

General Certificate of Education Examination

JUNE 2015 **ADVANCED LEVEL**

Subject Title	**Business Mathematics**
Paper No.	**I**
Subject Code No.	**7073**

One and a half hours

INSTRUCTIONS TO CANDIDATES

This paper is made up of TWO sections. Section A is based on the "BACCALAUREAT" approach (APPLIED MATHEMATICS).Section B is based on the LCCI approach (BUSINESS STATISTICS AND ADVANCED BUSINESS CALCULATIONS).

Answer ALL questions in **ONE SECTION ONLY**. The mark allocation per question is indicated. All necessary working must be shown.

You are allowed to use calculator, statistical formulae and financial tables where appropriate.

You will be provided with graph paper.

SECTION A: BACCALAUREAT APPROACH

1. A capital **K** is invested at compound interest at the annual rate, i for 1frs during n year. the interest produced are compounded annually given that:
   - The interest produced during the third year of investment amounts to 13 996.8 frs
   - The interest produced during the fourth year of investment amount to 15 116.54 frs
   - The total interest after n year of investment amounts to 173 838.74 frs

   Calculate the rate **i** and Capital **K** **(7 marks)**

2. Two women decided to save money weekly in an arithmetic progression. The first woman started with 25 000 frs and proposed to increase by 1000frs every week. The second started with 10 000 frs and proposed to increase by 2500frs every week. How long will it take the two women to have the same amount in their account?

   (N.B ignore interest) **(7 marks)**

3. Calculate the half yearly and quarterly rates of interest equivalents to 12% compounded annually. **(4 marks)**

4. A businessman bought a machine and paid 500 000 frs down price and the remainder to be paid in 10 equal constant end of annuities of 298 058.98 frs each. If interest is calculated at compound interest rate of 8%, calculate the cost of the machine. **(7 marks)**

5. At what compound interest rate can the sum of 100 000 frs amount to 214 252 frs after 7 years of annual capitalisation? **(5 marks)**

6. Two sums of money of 90 000 frs and 125 000 frs are invested for six years and four years respectively. What annual compounded interest rate will enable their accrued values to be equal? **(6 marks)**

7. A loan of 1 500 000 frs is contracted and is to be repaid by 20 constant annuities at the compound interest rate of 8% per annum:
   (a) Calculate the value of the 11^{th} amortisation
   (b) Calculate the capital due after the payment of the 15^{th} annuity **(7 marks)**

8. A trader invested 240 000 frs at a compound interest rate of 7.5% per annum. Determine how long this capital will take to amount to 480 000 frs. **(4 marks)**

9. A parent of a new born child decides that on each of the child's birth day up to the 16^{th} birth day to deposit 100 000 frs into an account which pays 9% compounded yearly. Determine how much will be in the account after the deposit on the 16^{th} birthday. **(4 marks)**

10. An ordinary loan is payable in 20 constant annuities at 10% compound interest. The last amortisation is greater than the first by 2 300 000 frs. Calculate;
    (a) The first amortisation
    (b) The constant annuity
    (c) The amount of the loan **(9 marks)**

11. The prices of Ndop rice for the past five years were as follows; 11 700, 12 600, 13500, 12 750, 15 600 frs respectively. Determine the geometric mean of the yearly prices. **(6 marks)**

12. Given the following consumption rate and price of some commodities for 2008 and 201 in a given city:

Commodity	2008		2012	
	Qty	Price	Qty	Price
Flour	1500	284	1660	302
Rice	246	2385	220	2600
Milk	1950	205	2100	230

Calculate:
(a) The laspeyres Price and quantity indexes.
(b) The paaches Price and Quantity Indexes. **(12 marks)**

13. The following statistical information were provided by Trust and Hope PLC
(a)

N	$\sum x$	$\sum x^2$	$\bar{x}$	SD
52	-	57300	33	-

(b)

N	$\sum x$	$\sum x^2$	$\bar{x}$	SD
18	-	-	57	4

Calculate the missing values **(8 marks)**

14. Given the following information on a statistical distribution:
$\sum xiyi = 8296$, $\sum xi = 261$, $\sum yi = 304$

$\sum xi^2 = 7127$, $\sum yi^2 = 9734$, $n = 10$

Calculate the Correlation Coefficient **(4 marks)**

15. The following data relates to sales figures of "Vision" Supermarket:

MONTHS	Jan	Feb	March	April	May	June	July
Sales(in Million FCFA	7	7.8	9	10	9.2	10	11

Determine the moving totals and moving averages of order 3 and locate them appropriately (1decimal place) **(10 marks)**

SECTION B: LCCI APPROACH

16. The following information is provided for a sample of 10 workers in CDC
$\sum x^2 = 111.7$, $\sum y^2 = 86.16$, $\sum x = 33$, $\sum y = 29$, $\sum xy = 97.74$
Determine and interpret the Correlation Coefficient. **(6 marks)**

17. Given the following table:

Xi	3	6	8	3	4
fi	2	4	0	1	3

(i) Construct a probability distribution for the above table **(3 marks)**
(ii) Calculate the variance using the probabilities in (i) above **(5 mark)**
(Total 8 marks)

18. Write short notes on the following: (a) Sampling (b) Sample (c) Stratified Sampling. **(2x3 – 6 marks)**

19. The geometric mean of 4, 10, x and 200 is 10. Determine the value of x, **(5 marks)**

20. A box contains 3 Red, 4 Black and 3White balls. Two balls are drawn with replacement. What is the probability of selecting?
(a) A red ball in the first and second draw? **(3 marks)**
(b) A black ball in the first draw and a white or red ball in the second draw? **(4 marks)**
(Total 7 marks)

21. The emergency unit at the Regional Hospital Bamenda measures the height of 35 men in the men's ward. The unit assumes that the Data represents a random sample of all the men in the hospital. From the data $\bar{x} = 70.2$ and $s = 2.44$. Construct a 95% confidence interval of the population mean height. **(5 marks)**

22. The mass of loaves of bread baked by a bakery follow a normal distribution with mean 500grams and a variance of 10.000 grams squared. If a loaf of bread is selected at random from the bakery. What is the probability that:
(a) The mass is less than or equal to 750 grams **(3 marks)**
(b) The mass is 560 grams or more **(3 marks)**
(Total 6 marks)

23 Draw a network diagram from the following table:

Activity	Proceeding Activity
A, B	-
C	A
D, E, F	B
G	C, D
H, I	F

Duration time A = 5, B = 4, C = 2, D =1, E = 5, F =5, G = 4, H = 3, I = 2.
Determine the critical path. **(9 marks)**

24. In a certain community, poor children are allocated monthly allowances in Arithmetic Progression. It is known that the first child was allocated 100,000fcfa and the fifth child 200000fcfa.
Calculate:
(a) The common difference **(2 marks)**
(b) The sum received by the first five children. **(4 marks)**
(Total 6 marks)

25. At the beginning of each year for two years, a deposit of 450 000 f rs is invested at 7.5% per annum simple interest. At what rate of compound interest can this investment produce the same future value? **(8 marks)**

26. A man bought a house on hire purchase scheme for 6 750 000 frs, the remainder, is paid in 8 equal monthly instalments. If the total amount paid is 435 000 frs, calculate the simple interest rate applied on the balance. **(8 marks)**

27. In a bankruptcy, an unsecured creditor received 21 458 frs when the dividends was 14 frs to 100 frs. How much did a creditor who received 259 115 frs invest in the bankrupt company and how much did a creditor with 4 161 573 frs receive? **(6 marks)**

28. A laptop costing 1000 000 frs will depreciate to a scrap value of 48 000 frs in 5 years. Given that the reducing balance method of depreciation is used, find the depreciation rate. **(6 marks)**

29. BACOCAM has an investment costing 5 000 000 frs. The Net present value (NPV) discounted at 10% per annum is 5 000 frs and at 12% is – 400 frs. The minimum required rate of returns is expected to be 10.5%. Should this project be accepted? **(7 marks)**

30. An investor sold his 5% stock at 85% and a proceed of 510 frs was realised. This investor decided to reinvest his proceed in 3½ stocks at 60F. Determine the value of the stock sold and his gain/loss in income .
(7marks)