CHRISTIAN SERVICE UNIVERSITY COLLEGE
KUMASI, GHANA
CSUC SCHOOL OF BUSINESS
DEPARTMENT OF MANAGEMENT AND GENERAL STUDIES

END OF FIRST SEMESTER EXAMINATIONS – 2021/22 ACADEMIC YEAR

LEVEL 100
CSBA 149: BUSINESS MATHEMATICS

MAY, 2022 **70MARKS** **TIME ALLOWED: 2HOURS.**

GENERAL INSTRUCTIONS TO CANDIDATES:
- Answer **THREE** questions in all:
- Answer all questions from Section A and **TWO** questions from Section B.
- Write your index number on top of the question paper and on every page of the answer booklet.

Examiner: Etse Nkukpornu

SECTION A: ANSWER ALL QUESTIONS (30 MARKS)

QUESTION 1.
a. Consider the data set representing the marks in percentage of 10 students in a theology class;

$$80, 52, 56, 50, 70, 80, 68, 64, 60, 80$$

Calculate:
   (i)   Arithmetic mean   (2 marks)
   (ii)   Harmonic mean   (4marks)

b. Consider the following sample data set 9, 1, 6, 6, 5.
Calculate;
   (i) the variance   (5 marks)
   (ii)the standard deviation   (5 marks)

   (iii) the coefficient of variation   (4 marks)
c. A project generated a net cash flow of GH¢ 20000 over a five year period, if the cost of capital is 10%, determine the present value of this project (**5 marks**)
d. A businessman invested GH¢50,000 at an annual rate of 12% compounded semi-annually for a period of 4-years. Calculate the future value.   (**5 marks**)

SECTION B: ANSWER ANY TWO QUESTIONS (20 marks each)

QUESTION 2.
Consider the Frequency distribution table

Height (cm)	1 – 4	5 - 8	9 – 12	13 – 16	17 – 20
No of children	7	12	15	9	7

Calculate
   (i)   the arithmetic mean   (5 marks)
   (ii)   the harmonic mean   (5 marks)
   (iii) the standard deviation   (5 marks)
   (iv) coefficient of variation   (5 marks)

QUESTION 3.

a. The Head of your church decided to invest the annual harvest amount of GH¢15,000 at a rate 10% per annum for 5-years. Calculate the:

   (i) future value if the investment is done on Simple Interest basis **(4 marks)**

   (ii) future value if the investment is done on a compounding basis **(4 marks)**

   iii) Comment on the preferred investment **(4 marks)**

b. A businessman invested GH¢10,000 at an annual rate of 5% per annum compounded quarterly for 150 days.

What is the future value on this investment? **(8 marks)**

QUESTION 4.

a. The total cost of manufacturing Q items is $C_{(q)} = Q^3 + 11Q^2 + 40Q + 10$. Find the marginal cost at a production level of 100.   (2 marks)

b. If a firm total revenue (in thousand) is given by $TR = Q^2 + 10Q + 2$. Calculate

   (i) the marginal revenue at Q   (2 marks)

   (ii)the marginal revenue at Q = 10, 20 and 30   (6 marks)

c. Solve the quadratic function

    $y = 3x^2 + 12x - 36$ (4 marks)

d. Find the first, second and third derivative of the function

    $y = 5x^3 + 4x^2 - 8x + 3$ (6 marks)

QUESTION 5.

A project requires GH¢200,000 for its execution and the cashflow for the project for 5-years at a cost of capital of 5% is shown in the table below.

Year	Cash inflow (GH¢)	Cash outflow (GH¢)
1	50,000	110,000
2	80,000	25,000
3	140,000	120,000
4	120,000	125,000
5	95,000	40,000

   culate

    the Net cashflows   (5 marks)

    the Discount factors   (5 marks)

Examiner the Net Present Value (NPV)   (5 marks)

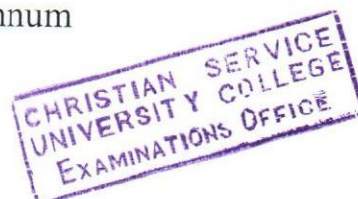   omment on the project (accept or reject)   (5 marks)

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  iii) Comment on the preferred investment **(4 marks)**

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Calculate
  (i)   the Net cashflows   (**5 marks**)
  (ii)   the Discount factors   (**5 marks**)
  (iii) the Net Present Value (NPV)   (**5 marks**)
  (iv)   comment on the project (accept or reject)   (**5 marks**)