



University of Kelaniya - Sri Lanka

Centre for Distance and Continuing Education

Faculty of Commerce & Management Studies

Bachelor of Business Management (General) Degree First Examination (External) – 2023

May - 2025

BMGTE 1055 – Mathematics for Business

No of questions – Eight (08)

Time: 03 Hours

Answer any five (05) questions only.

Non-programmable Calculators are allowed only.

Question No. 01

- (a) Explain the role of Business Mathematics in effective decision-making within organizations.

(10 marks)

- (b) Explain the following number types with a suitable example for each.

- i) Natural Numbers
- ii) Whole numbers
- iii) Integer Number
- iv) Rational Numbers
- v) Irrational numbers

(10 marks)

(Total 20 marks)

Question No. 2

- (a) Solve the following equation.

$$x(x-7)=18$$

(05 marks)

- (b) Express the following as a perfect square.

$$9x^2 + 30x + 25$$

(05 marks)

- (c) Factorize the following expression.

$$16 - 25(x-2)^2$$

(05 marks)

- (d) Solve the following pair of simultaneous equations.

$$3x + 4y = 17$$

$$4x - 3y = 6$$

(05 marks)

(Total 20 marks)

Question No. 3

- (a) Simplify the expression, $\frac{(a^2)^3 \times (b^3)^2}{(a^3b)^2}$

(05 marks)

- (b) Solve the following equation,

$$x(x-2) - 80 = 0$$

(05 marks)

- (c) Evaluate $\log_2 \left(\frac{8}{3}\right) + \log_2 12$

(05 marks)

- (d) Solve the following logarithmic equation for x

$$x \log_{10} 2 = \log_{10} 128$$

(05 marks)

(Total 20 marks)

Question No. 04

- (a) What do you mean by permutations and combinations? Explain with examples.
(05 marks)
- (b) A committee of 3 persons is to be constituted from a group of 2 men and 3 women.
- (i) In how many ways can this be done?
(05 marks)
- (ii) Find how many ways of a committee of 03 persons would consist of 01 man and 02 women?
(05 marks)
- (c) In a group of 6 boys and 5 girls, four children are to be selected. In how many different ways can they be selected such that at least one boy and one girl should be there?
(05 marks)
- (Total 20 marks)**

Question No. 05

- (a) How many multiples of 4 lie between 10 and 250? (Answer applying your progression knowledge)
(05 marks)
- (b) The sum of 4th and 8th terms of an Arithmetic progression is 24 and the sum of the 6th and 10th terms is 44. Find the first three terms of the Arithmetic progression.
(05 marks)
- (c) If the first term of a Geometric progression is 20 and the common ratio is 4. Find the 5th term of the Geometric progression.
(05 marks)
- (d) A city has a population of 30000 people in the year 2025. If the population increases 15% per year, what will the population be in 2035?
(05 marks)
- (Total 20 marks)**

Question No. 06

- (a) The difference between Compound Interest and Simple Interest on a sum of money over 2 years at an annual interest rate of 15% is Rs. 675. What is the principal amount?
(05 marks)
- (b) If a loan of Rs. 5000 incurs a simple interest of Rs. 1800 over 4 years, what is the annual rate of interest?
(05 marks)
- (c) An investment of Rs.600,000 grows to Rs.1,200,000 in 6 years under annual compound interest. What is the annual interest rate?
(05 marks)
- (d) How long, to the nearest year, will it take for an investment of Rs.10000 to reach Rs.15500 if it is invested at 6% per annum compounded quarterly? (Answer to the closet years)
(05 marks)
- (Total 20 marks)**

Question No. 07

- (a) A product's demand function is $P = 1200 - 3q$. It has a fixed cost of Rs.1000 and a variable cost of $80q + 4q^2$, where q is the number of units produced, and P is the unit price. Using the given invormations,
- i) Find the Total Revenue function
 - ii) Find the Total Cost function.
 - iii) Find the profit function.
 - iv) Find the number of units at which profit is maximized.
 - v) Find the Maximum profit.
- (02 marks for each)

- (b) For a certain product, the demand function is given by:

$$P = 100 - 5q - q^2$$

Where:

p is the price and q is quantity

When price is equal to 0, what is the consumer surplus?

(05 marks)

- (c) The marginal revenue function of a commodity is given as $MR = 1500 - 3x^2 - 6x$

Find the total revenue function and the corresponding demand function.

(05 marks)

(Total 20 marks)

Question No. 08

- (a) Find the sum of the following matrices A and B.

$$A = \begin{bmatrix} 3 & -5 & 1 \\ 6 & 0 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 0 & -2 & 1 \\ 1 & -4 & 3 \end{bmatrix}$$

(05 marks)

- (b) Find the product of the following matrices A and B

$$A = \begin{bmatrix} 0 & 1 \\ 3 & 2 \\ -1 & 4 \end{bmatrix} \quad B = \begin{bmatrix} -1 & 2 & 5 \\ -1 & 3 & 1 \end{bmatrix}$$

(05 marks)

- (c) Solve the following system of linear equations, using matrix inversion method.

$$-x + z = 2$$

$$-x + y + 2z = 0$$

$$2y + 3z = 1$$

(10 marks)

(Total 20 marks)