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) – 2021

October 2023

BMGT E1055 – Mathematics for Business

No of questions – Eight (08)   Time: 03 Hours

Answer any five (05) questions only.

Question No. 01

(a)   What is meant by a number system?

(05 marks)

(b)   Explain the following different types of numbers with suitable examples.

        i.   Natural Numbers

        ii.   Whole numbers

        iii.   Integer Numbers

        iv.   Rational Numbers

        v.   Irrational numbers

(10 marks)

(c)   What are the applications of the number system in business management? Briefly explain.

(05 marks)

(Total 20 marks)

Question No. 02

(a) Rewrite the following incorrect equation correctly.

$(2a)^2 + 5a = 4a + 5a$

(04 marks)

(b) Factorize the following expression:

$14(3x - 5y)^3 + 7(3x - 5y)^2$

(04 marks)

(c) Solve the expression, $(4x^2 - 100) \div 6(x + 5)$

(04 marks)

(d) Express the following as in the form of (a+b)(a-b)

$32x^2y^2 - 8$

(04 marks)

(e) If the area of a rectangle is $6a^2 + 36a$ and 36a width. Find the length of the rectangle.

(04 marks)

(Total 20 marks)

Question No. 03

(a) Simplify the expression: $(p^3)^0 \times (p^{1/2})^4$.

(05 marks)

(b) Evaluate: $(1/216)^{-2/3} \div (1/27)^{-4/3}$.

(05 marks)

(c) Express $\log(75/16) - 2\log(5/9) + \log(32/243)$ in terms of log 2 and log 3.

(05 marks)

(d) Fill in the following blanks to complete the logarithm properties, given below:

i. $\text{Log}_b MN = \ldots\ldots\ldots\ldots\ldots\ldots$

ii. $\text{Log}_b M/N = \ldots\ldots\ldots\ldots$

iii. $\text{Log}_b M^P = \ldots\ldots\ldots\ldots\ldots$

iv. $\text{Log}_b 1 = \ldots\ldots\ldots\ldots$

v. $\text{Log}_b b = \ldots\ldots\ldots\ldots\ldots$

(05 marks)

(Total 20 marks)

Question No. 04

(a) What is the difference Between Permutation and Combination? Explain.

(05 marks)

(b) An examination question paper consists of two parts, part A and part B. Part 1 contains questions A1, A2, A3, and A4. Part B contains question B1, B2, B3, B4, B5, B6 and B7. Candidates must choose three questions from section A and four questions from section B. The order in which they choose the questions does not consider. Based on these information answer the following questions.

i. In how many ways can the seven questions be chosen?

(05 marks)

ii. Assuming that all selections are equally likely, find the probability that a particular candidate chose question A1 but does not choose question B1.

(05 marks)

iii. If candidates who chose question A1 are not allowed to chose question B1. In how many ways can the seven questions now be chosen?

(05 marks)

(Total 20 marks)

Question No. 05

(a) There are 100 students in a Student Activity Club of which 35 like drawing and 45 like music. 10 students are interested in both drawing and music. Find the number of students that like either of them or neither of them.

(05 marks)

(b)   Mrs Kanthi, novelist is plaining to write a new novel. She plans to write 15 pages in the first week, 17 pages in the second week, 19 pages in third week, and 21 pages in fourth week, and so on. (She writes an extra two pages each week compared with the pervious week), then,

i.   Find the number of pages she plans to write in the tenth week.

(05 marks)

ii.   How many pages she plans to write in the first ten weeks.

(05 marks)

iii.   If she plan to produce a book with 480 pages, after n weeks, then determine the value of n.

(05 marks)

(Total 20 marks)

Question No. 06

(a)   A house is valued at Rs. 15 000 000. On average, the house price increases by 0.24% monthly compounding over two and half years. What is the future value of the house after two and half years?

(10 marks)

(b)   Calculate the interest rate for an account that started with Rs. 50 000 and now has Rs.130 000 and has been compounded annually for the past 12 years.

(10 marks)

(Total 20 marks)

Question No 07

(a)   If, Demand Function is $D = 160 - 0.0025x$ and Cost function is $C = 15x + 0.0025x^2$ Find the revenue-maximizing output level.

(05 marks)

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(b) The marketing department of ABC company recommends manufacture and market a new school bag. The financial department provides the following cost function (Rs) $C(x) = 600 + 120 x$ and revenue function (Rs.) is $R(x) = 15 x + 0.005 x^2$.

    i.   Find the marginal cost (MC) function

    ii.   Find the marginal revenue (MR) function.

(05 marks)

(c) Weekly profit function of a company is given by $P = 1400q - q^2 - 240,000$ where q is the number of units produced per week. Calculate the number of units to be sold to maximizing the weekly profit.

(05 marks)

(d) Given the demand function $P_d = 35 - Q^2$ and the supply function $P_s = 3 + Q^2$.

Calculate the producer surplus for the supply function.

(05 marks)

(Total 20 marks)

Question No. 08

(a) What is the sum of the following matrices A and B ?

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

(05 marks)

(b) Multiply the following two matrices.

$$\begin{bmatrix} 2 & 1 & 1 \\ 4 & 6 & 5 \end{bmatrix} \quad \begin{bmatrix} 1 & -1 \\ 1 & -1 \\ -1 & 1 \end{bmatrix}$$

(05 marks)

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

$$5x + 2y = 3$$
$$3x + 2y = 5.$$

(10 marks)

(Total 20 marks)