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) – 2019

April - 2023

BMGT E1055 - Mathematics for Business

No. of Questions: Eight (08) Time: 03 hours

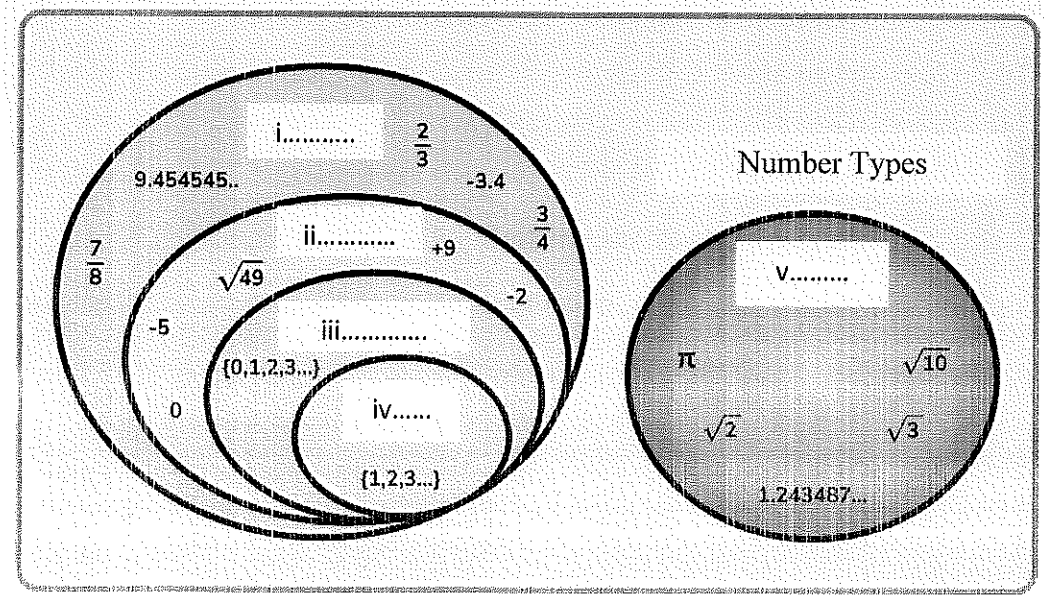
Answer any 05 questions only.

Question No. 01

a) What is the role of business mathematics in decision-making?

(05 marks)

b) Fill in the following blanks from i to v, giving the name of the appropriate number type.



(05 marks)

c) State whether the following numbers are rational or irrational when giving reasons.

i. π

ii. 1.4

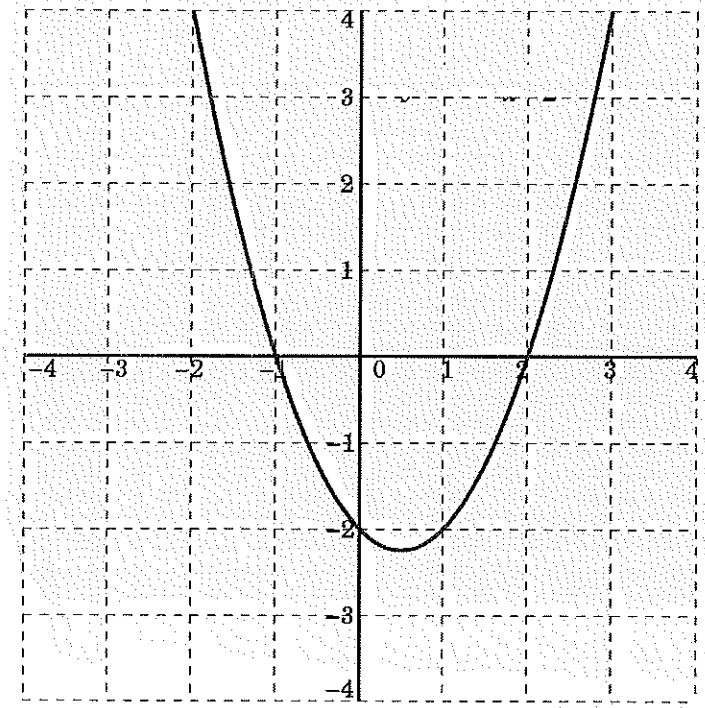
iii. 1.61803.....

iv. 1.7373737373.....

v. $0.\overline{02}$

(05 marks)

d) What is the equation of the following quadratic function?



(05 marks)

(Total 20 marks)

Question No. 02

a) Solve the following equation.

$(x-1)^2 = \{4\sqrt{(x-4)}\}^2$

(05 marks)

b) Solve the following quadratic equation by factorizing.

$2x^2 + 7x - 4 = 0$

(05 marks)

c) Solve the equation; $6x^2 + 13x = 5$ by using completing the square method.

(05 marks)

d) Solve the following pair of simultaneous equations.

$5a + b = 17$

$8a - 2b = 2$ (05 marks)

(Total 20 marks)

Question No. 03

a) The denominator of a fraction is excess 3 more than its numerator. If both the numerator and the denominator are increased by 4, the fraction becomes $\frac{4}{5}$. What was the original fraction?

(05 marks)

b) Amila is 2 years older than Bimal, who is twice as old as Chamil. If the total number of years of ages of Amila, Bimal and Chamil is 27 years, how old is Bimal?

(05 marks)

c) A quiz has thirty questions whose answers can only be correct or incorrect. A correct answer scores each 8 points, but 3 points are deducted for every incorrect answer. Gihan did the quiz and scored a total of 152 points. How many questions did he get correct?

(05 marks)

d) Write the following expressions by using algebra;

A number z is multiplied by 4. Then 8 is subtracted from the result. The final answer would be greater than or equal to 28.

(05 marks)

(Total 20 marks)

Question No. 04

a) Simplify the following expression.

$$\frac{(2x^{\frac{1}{2}})^3}{4x^2}$$

(05 marks)

b) Given that $32.\sqrt{2} = 2^a$, find the value of a.

(05 marks)

c) Find the value of x if $\log(x-1) + \log(x+1) = \log_2 1$

(05 marks)

d) If $\log_{10} 5 + \log_{10}(5x + 1) = \log_{10}(x + 5) + 1$, find the value of x.

(05 marks)

(Total 20 marks)

Question No. 05

a) Let A, B, and C be three sets. Draw a Venn diagram and shade the area representing each of the following.

i. $A \cup B \cup C$

ii. $A \cap B \cap C$

iii. $A \cup (B \cap C)$

iv. $A - (B \cap C)$

v. $A \cup (B \cap C)^c$

(10 marks)

b) The student in a class of 40 plays at least one indoor game, chess, carrom and table tennis. From these students, 18 play chess, 20 play table tennis and 27 play carrom. Further, 7 play chess and table tennis, 12 play table tennis and carrom and 4 play chess, carrom and table tennis.

Find the number of students who play,

(i) chess and carrom.

(ii) chess, carrom but not table tennis.

(10 marks)

(Total 20 marks)

Question No. 06

a) If the rate is 10% and the principal is Rs. 50 000, formulate the Compound Interest for 2 years if it is compounded half-yearly.

(05 marks)

b) Calculate the interest rate for an account that started with Rs..5 000 and now has Rs.13,000 and has been compounded annually for the past 12 years.

(05 marks)

c) i. What is the Future Value of an Annuity?

ii. What is the difference between ordinary Annuity and Annuity Due? Explain with examples.

(05 marks)

d) i. What does Net Present Value (NPV) mean?

ii. How do you select the best project using NPV?

(05 marks)

(Total 20 marks)

Question No. 07

a) Expand the expression $(2x - 3)^6$ using the binomial theorem.

(05 marks)

b) Evaluate $(201)^3$ using the binomial theorem

(05 marks)

c) It is needed to select 05 children from a group which consists of 4 girls and 7 boys. In how many ways can a team of 5 members be selected if the team has at least one boy and one girl.

(05 marks)

d) In a rural village, there are 87 families, of which 52 families have at most 2 children. In a rural development programme, 20 families are to be chosen for assistance, of which at least 18 families must have at most 2 children. In how many ways can the choice be made?

(05 marks)

(Total 20 marks)

Question No. 08

a) Differentiate the following functions with respect to x,

i. $Y= \sqrt{5x+6}\,(2x^3+8)$

ii. $Y= \frac{8x^2+5x}{\sqrt{(x+4x)}}$.

(05 marks)

b) The demand function for a certain commodity is p(x) = 10-0.001x.
Where p is measured in Rs, and x is the number of units producing and cost of production of x items is,
C (x)= 50+ 5x. Determine the level of production that maximizes the profit.

(05 marks)

c) The demand function of a monopolist is given by , $p= 1500-2x-x^2$.
Find the Revenue Function, Marginal Revenue Function, and Marginal Revenue when x=20.

(05 marks)

d) The marginal revenue function of a commodity is given as $MR= 12-3x^2+4x$. Find the Total Revenue and the corresponding Demand Function.

(05 marks)

(Total 20 marks)