(Knowledge for Development)

KIBABII UNIVERSITY

(KIBU)

UNIVERSITY EXAMINATIONS
2020/2021 ACADEMIC YEAR

SPECIAL/SUPPLEMENTARY EXAMINATIONS
YEAR ONE SEMESTER TWO EXAMINATIONS

FOR THE DIPLOMA IN
(INFORMATION TECHNOLOGY)

COURSE CODE : DIT 063

COURSE TITLE : BASIC MATHEMETICS

DATE: 07/01/2022 **TIME: 2.00 P.M- 4.00 P.M**

INSTRUCTIONS TO CANDIDATES

ANSWER **QUESTIONS ONE AND ANY OTHER TWO**

QUESTION ONE (COMPULSORY) (28 MARKS)

a. Define

i. Trigonometry (2 marks)

ii. Quadratic equation (2 marks)

b. In a group of 6 boys and 4 girls, four children are to be selected. In how many different ways can they be selected such that at least one boy should be there? 4 marks)

c. Find the sum of all the numbers between 0 and 207 which are exactly divisible by 3 (4 marks)

d. Simplify the following $\frac{5^4.6^{-2}}{5^2}$ (3 marks)

e. Solve the following equations using logarithms $log_3 \frac{1}{27} = x$ (2 marks)

f. Solve the following quadratic equation using quadratic formula

i. $x^2 - 2x + 2 = 0$ (3 marks)

ii. $x^2 + 2x - 8 = 0$ (2 marks)

g. Simplify $3\sqrt{2x} - 5\sqrt{8x} + \sqrt{72x}$ (4 marks)

h. Using the remainder theorem find the remainder when $(3x^2 - 4x + 2)$ is divided by $(x - 2)$ (2 marks)

QUESTION TWO (16 MARKS)

a. If two letters are to be selected from A, B, C, D and E considering the order of selection, find the possible outcomes (4 marks)

b. State the remainder theorem (2 marks)

c. Using the theorem above find the remainder of $x^3 - 2x^2 - 5x + 6$ When divided by $(x + 2)$ and explain your answer (3 marks)

d. Using long division divide $(x^3 - 2x^2 - 5x + 6)$ by $(x + 2)$ (5 marks)

e. Find the value of x given $log_4 64 = x$ (2 marks)

QUESTION THREE (16 MARKS)

a. Define the term Arithmetic series (2 marks)

b. Which term of the series $2187, 729, 243, \ldots\ldots\ldots is\ {}^1/_9$? (5 marks)

c. Determine the i) 9^{th} and ii) 16^{th} term of the series $2, 7, 12, 17, \ldots\ldots\ldots$ (4 marks)

d. Solve $x^2 - 2x + 8 = 0$ by completing squares (5 marks)

QUESTION FOUR (16 MARKS)

a. Use the binomial series to determine the expansion of $(2 + x)^7$ (6 marks)

b. A drilling machine is to have 6 speeds ranging from 50rev/min. if the speed form a geometric progression determine their values each correct to nearest whole number. (7 marks)

c. Find the value of x

$200(1.1)^x = 20{,}000$ (3 marks)

QUESTION FIVE (16 MARKS)

a. Given a right angle triangle with hypotenuse 15cm and the length of 12cm find the solutions of all the six trigonometric functions (8 marks)

b. Verify that $\cos(180° - x) = -cosx$ and $\sin(180° + x) = -sinx$ (4 marks)

c. Given a triangle with the sides ABC where the angle ABC is $X°$ and the length $b$is 2.3 cm and the angle BCA is 43° and the length c is 3.5 cm. using sin rule find the solutions of $X°$ (4 marks)