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**KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY
UNIVERSITY EXAMINATION, 2017/2018 ACADEMIC YEAR
DIPLOMA IN BUSINESS INFORMATION TECHNOLOGY**

DBT - 009 BASIC MATHEMATICS

Date:

Time:

INSTRUCTIONS TO CANDIDATES

ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

a) Solve for x in the following

i. $\{3 - (5x - 4)\} + 4x = 0$ (4 Marks)

ii. (ii) $\frac{2x+6}{6} - \frac{x-2}{2} = \frac{1}{12}$ (4 Marks)

(iii) $2(1 + x) + 3(x - 2) > 25$ (4 Marks)

b) Calculate the rate per annum, at which a certain amount of money doubles after being invested for a period of 5 years compounded annually

(4Marks)

c) A Car is valued at ksh 800,000 and is expected to depreciate in the value by 20% each year. Find its value after 3 years

(5Marks)

d) Evaluate $\frac{96}{6} + 7x5 - 14x5$ (4 Marks)

e) A person had a rectangular-shaped garden with sides of lengths 16 feet and 9 feet. The garden was changed into a square design with the same area as the original rectangular-shaped garden. How many feet in length are each of the sides of the new square-shaped garden?

(5 Marks)

QUESTION TWO (20 MARKS)

- a) Solve for x in the inequality and represent on a number line

$$4(1 + x) + 6(x - 2) > 50 \quad (3 \text{ Marks})$$

- b) Simplify the following fractions

$$\frac{2}{2+x} + \frac{4}{1-3x} \quad (4 \text{ Marks})$$

- c) Jane obtained a simple interest loan of ksh 40,000 at an interest rate of 24% per annum. If the loan is to be paid in monthly installments over four years.

Calculate

- i. The amount of interest paid back over the four years (3 Marks)

- ii. The total amount to be paid back (2 Marks)

- iii. The monthly repayment amount (2 Marks)

- d) Solve by factorization method

$$k^2 - 5k + 6 = 0 \quad (3 \text{ Marks})$$

- e) Find the seventh term in the following sequences.

$$5, 6, 14, 29, 51, 80.. \quad (3 \text{ Marks})$$

QUESTION THREE (20 MARKS)

a) The data below shows the masses of patients drawn from wards in a hospital on a given day

Mass(kg)	No of patients
30-35	5
35-40	8
40-45	10
45-50	6
50-55	3
55-60	2

Use the data to calculate the following;

- i. Arithmetic Mean
- ii. Median
- iii. Mode

(15 Marks)

b) Evaluate;

$$\frac{\frac{1}{2} \text{ of } 3\frac{1}{2} + 1\frac{1}{2} \left(2\frac{1}{2} - \frac{2}{3} \right)}{\frac{3}{4} \text{ of } 2\frac{1}{2} \div \frac{1}{2}}$$

(5 Marks)

QUESTION FOUR (20 MARKS)

a) A swimming pool of water surface measures 10m long by 8m wide. A path of uniform width is made all round the swimming pool. The total area of the water surface and the path is 168m^2 . Find the width of the path

(5 Marks)

b) A Lady bought 10 mangoes at sh.9.00. She ate four of the mangoes and sold the remainder, making an overall profit of sh18.00. Determine

- i. Her selling price per mango (3 Marks)
- ii. The percentage profit on each mango (2 Marks)

c) The sum of the ages of two installations is 46 months. The modern version is 10months younger than the original. Calculate their present ages

(5 Marks)

d) Perform the following integrations using the method indicated

$$\int \frac{2x+3}{x^2-2x+1} dx \text{ (Express first as partial fractions)}$$

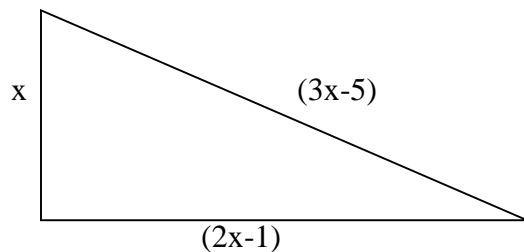
(5 Marks)

QUESTION FIVE (20 MARKS)

a) Find the area of an isosceles triangle with side 6cm if angle between the two sides is 40 degrees. (4 Marks)

b) A farmer has twice as many oranges and half as many bananas as oranges. If she has 45 fruits all together in her stall, how many oranges does she keep in her stall? (4Marks)

c) The perimeter of a square is 24cm. Find the area of the square
The diagram shows the lengths, in cm, of the sides of a triangle



(3 Marks)

d) The perimeter of the triangle is 17. Find the value of x (5Marks)

e) Determine the number of permutations of the letters of the word (4Marks)