



TRAINEE'S NAME
MODULE
CLASS

HOLIDAY PACKAGE OF MATHEMATICS FOR LEVEL 5 ACCOUNTING.

INSTRUCTIONS

***The paper is composed by TWO sections;**

***Section I and II: COMPLUSORY**

*** EXAM duration: 2 WEEKS**

***Mathematical instruments are allowed.**

SECTION I: ATTEMPT ALL QUESTIONS /100marks.

Q1. Set $A = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 0\}$. Write down the subsets of A are:

- a) Even numbers
- b) Odd numbers
- c) Prime numbers
- d) Intersection between even and prime numbers subsets.

Q2. From the following mathematical expression:

$$x + 1 = 0, \quad 5 < x, \quad 1 = x^2 \text{ and } x^3 - 1 = 0$$

Which one of these expressions is form of:

- a) Linear inequality,
- b) Quadratic equation.

Q3. Solve in the set of real numbers:

a) $3x - 4 = 2x + 1$

b) Solve the following inequality: $x - 3 < 7$

Q4. Use clear sketches to differentiate a horizontal asymptote and a vertical asymptote. (Hint: Use only 2 graph).

Q5. Evaluate the following limit: $\lim_{x \rightarrow 2} \frac{2x^2 - 3x - 2}{x - 2}$

Q6. Solve for x

a) $10^x = 1$

b) $\log 100,000,000 = x$

Q7. Solve in the set of real numbers

a) $\frac{3}{x-6} = \frac{4}{2x-5}$

b) $\frac{-x+5}{x-3} = \frac{4}{7}$

Q7. Given the following function: $f(x) = \frac{x^3 + x}{5}$

a) Find $f(-x)$ and $-f(x)$

b) Comment on the result found in a) about the parity function f.

Q8. Solve algebraically the following quadratic equation $2x^2 + x - 6 = 0$

Q9. Find the domain of definition of the following: $(x) = \frac{\sqrt{x^2 - 4}}{x^2 - 8x + 15}$.

Q10. Find the derivative of the following function: $f(x) = (x^2 + 6)(x - 2)$

SECTION II: CHOOSE ONLY 4 QUESTIONS/60 marks

Q11. Study the function $f(x) = \frac{2x^2}{2x^2 - 8}$

Determine:

a) The domain of definition

b) The range of function

c) Parity

d) The asymptote to the curve

e) The first derivative.

Q12. Calculate for which value(s) of m the equation $x^2 + 3mx + m + \frac{5}{4} = 0$ has:

a. Two real roots

b. One double root

c. No real root

Q13. Given that $f(x) = 3 - 7x + 5x^2 - x^3$, show that $3 - x$ is a factor of $f(x)$. Factorize $f(x)$ completely and hence state the set of values for which $f(x) \geq 0$

Q14. Evaluate the following limits:

a) $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2} =$

b) $\lim_{x \rightarrow \infty} \frac{7x^4 - 3x^3 + x^2 + 2x + 1}{5x^4 + x^2 - x - 2} =$

Q15. Differentiate

a) $f(x) = (2x^4 + 1)^4$

b) $y = \frac{5x^2 - 7x}{x^3 + 2x}$

MATHEMATICS GIVE US HOPE THAT EVERY PROBLEM HAS A SOLUTION!!!!!!