REPUBLIQUE DU CAMEROUN
Paix-Travail-Patrie
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REGION DE L'ADAMAOUA
****
DELEGATION REGIONALE DES ENSEIGNEMENTS SECONDAIRES
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INSPECTION REGIONALE DE PEDAGOGIE CHARGEE DE L'ENSEIGNEMENT DES SCIENCES
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AMICALE DES ENSEIGNANTS DE MATHEMATIQUES DE L'ADAMAOUA (AMEMA)

REPUBLIC OF CAMEROON
Peace-Work-Fatherland
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ADAMAWA REGION
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REGIONAL DELEGATION OF SECONDARY EDUCATION
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REGIONAL INSPECTORATE OF PEDAGOGY IN CHARGE OF TEACHING SCIENCES
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ASSOCIATION OF MATHMATICS TEACHERS OF ADAMAWA (AMEMA)

REGIONAL COMPETITION OF MATHEMATICS 2026. ***UPPER SIXTH.***

INSTRUCTION: ANSWER ALL QUESTIONS IN BOTH SECTIONS ***Duration: 2hours***

SECTION A: MULTIPLE CHOICE QUESTIONS.

In Questions 1-10, some information is given and is followed by a number of possible responses. ***One or more of the suggested responses is/are correct****. Write down the* ***letter(s)*** *corresponding to the* ***correct response(s).***

1) $2x^2 - 7x + 10 = 0$ has roots $\alpha \; and \; \beta$
- a) $\alpha\beta = -2$
- b) $\alpha + \beta = 3\frac{1}{2}$
- c) $\alpha \; and \; \beta$ are real roots

2) $f(x) = (3 - 5x)^4$
- a) $f(x)$ has a remainder 1 when divided by $x - 1$
- b) the expansion of $f(x)$ contains four terms
- c) the equation $f(x) = 0$ is satisfied by only one vale of x

3) The equation of the line $l: y = 2x - 1$
- a) the line through the origin perpendicular to l is $y + 2x = 0$
- b) the line through $(1,2)$ parallel to l is $y = 2x - 3$.
- c) l passes through $(1,2)$

4) $f(x) \equiv x + \frac{1}{x}$.
- a) $f(x)$ is stationary when $x = -1$
- b) $\frac{d}{dx}f(x) = 1 - \frac{1}{x^2}$
- c) $y = f(x)$ has no turning point

5) $\sin(\theta - \frac{\pi}{2}) \equiv$
- a) $\cos(\theta + \frac{\pi}{2})$
- b) $\sin(\frac{\pi}{2} - \theta)$
- c) $\cos\theta$
- d) $\sin(\theta + \frac{3\pi}{2})$

6) $\sum_{r=2}^{12} \frac{2^r}{r}$.
- a) the series has eleven terms
- b) the series is a GP
- c) the third term of the series is $\frac{2^3}{3}$

7) $\int_0^n \tan x \, dx$ can be evaluated if
- a) $n = \frac{\pi}{4}$
- b) $n = -\frac{\pi}{3}$
- c) $n = \frac{\pi}{2}$
- d) $n = -\frac{\pi}{2}$

8) If the equation $ax^2 + by^2 + 2gx + 2fy + c = 0$ represents a circle through the origin,
- a) $g = 0 \; and \; f = 0$
- b) $c = 0$
- c) $a = b$
- d) $a = -b$

9) A vector equation of the line is $r = i + 2j + 3j + \mu(4i - j + 7k)$.
- a) The line passes through $(4, -1, 7)$
- b) The length of the line is $\sqrt{14}$
- c) The line passes through $(1, 2, 3)$

10) $\bar{z}$ is the conjugate of z:
- a) $|\bar{z}| = |z|$
- b) $arg\, z = arg\, \bar{z}$
- c) $z\bar{z}$ is real
- d) $\frac{z}{\bar{z}}$ is real

SECTION B: SHOW ALL YOUR WORKING

1) A woman buys a house for 15million FCFA to live in with his family. Given that the house depreciates by 8% annually. After 10years of living in that house, she was transferred to another town. Now she wants to sell the house. What price do you think she should sell the house to be fair?

2) a) Find the number of different selections of letters that can be made from the letters of the word CHEMISTRY.

b) How many of these selections contain no vowels.

3) i) Evaluate $cos\left[sin^{-1}(-\frac{1}{3})\right]$

ii) Show that $cot(A+B) - tan(A-B) = \frac{2cos2A}{sin2A+sin2B}$

4)Given the matrices $A = \begin{pmatrix} 2 & -1 & -2 \\ -1 & 1 & 0 \\ -2 & 1 & 3 \end{pmatrix}$ and $B = \begin{pmatrix} 3 & 1 & 2 \\ 3 & 2 & 2 \\ 1 & 0 & 1 \end{pmatrix}$,

a) Evaluate AB.

b) Hence solve the system of equations

$3x + y + 2z = 11$

$3x + 2y + 2z = 10$

$x + z = 5$

5) Given the real-valued function $f, where\ f(x) = \frac{3x^2-4x}{x^2-2x+1}$

a) State the domain of definition, (D_f) of f and evaluate the limits at its bounds of $D_f)$

b) Find the values of a b and c, for which $f(x) = a + \frac{b}{(x-1)} + \frac{c}{(x-1)^2}$ .Hence, state all the equations of the asymptotes to the curve, (C_f) of f

c) Prove that $f'(x) = \frac{2(2-x)}{(x-1)^3}$ and draw up a table of variation of this function.

d) Sketch the curve (C_f), of f.