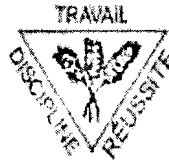


COLLEGE PRIVE BILINGUE MONTESQUIEU
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REPUBLIC OF CAMEROON
 PEACE-WORK-FATHERLAND
 SCHOOL YEAR 2024/2025

| | | |
|------------|---------------------|----|
| EXAM | maths: 4th sequence | |
| CLASS | Lower sixth | 2h |
| NOM/NUMERO | | |

.Answer all the questions, showing all the working.

SECTION A

- A) Given that $g(x) = x^3 + x^2 + 2x$ and $f(x) = \frac{x+2}{g(x)}$. Show that $x+1$ is a factor of $g(x)$. Hence express $f(x)$ in partial fractions. .b) Given that $f(x) = ax^2 + bx + c$ leaves remainder 1, 25, 1 when divided by $x-1, x+1$, and $x-2$ respectively, show that $f(x)$ is a perfect square.
- A) Express the following partial fraction a) $x-1/x^2(x+1)$ b) $2x-1/(x+1)(x^2+2)$
- A) Find the a formula for the nth term of the sequences 11, 7, 3... .b) The 3rd term of an AP is 8 and 16th is 47. Find the 1st term and the common difference. c) The 1st term of AP is Log a and 9th term is Log 28a. Find the common difference

SECTION B

- Three events A, B and C are such that A and B are mutually exclusive, while B and C are independent. Given that $P(A) = \frac{3}{10}$, $P(A \cup B) = \frac{2}{5}$, $P(A \cup C) = \frac{7}{10}$, $P(B \cup C) = \frac{11}{20}$, FIND a) $P(B)$ b) $P(C)$ c) $P(A/C)$
- The probability distribution for a discrete random variable Y is given below.

| | | | | | | |
|--------|---|----|----|----|----|-----|
| Y | 1 | 3 | 5 | 7 | 9 | 11 |
| P(Y=y) | C | 3C | 5C | 7C | 9C | 11C |

- Find the value of C
 - Find $P(1 < Y < 3)$
 - Find $P(3 < Y < 9)$
 - Find $P(Y < 7)$
 - State the mode
- 3) The discrete random variable X has cumulative distribution function $F(x)$ defined by

$$F(x) = \begin{cases} \frac{x}{16} (8 - X), & X=1, 2, 3, 4 \text{ AND } 1, X > 4 \end{cases}$$

- Find the probability distribution of x
 - Find $E(x)$ and $\text{Var}(x)$
 - Determine the mode and the median of x
- 4) The continuous random variable x has probability function f given by

$$F(x) = \{k(k + 3), -3 < x < 3 \text{ and } 0, \text{ otherwise}$$

- The value of the constant K
- The mean of X
- The variable of X

- D) The cumulative distribution function of X
- E) The median of X , giving your answer correct to 1 decimal place
- f) The values of the constants a and b if $E(aX+b)=5$ and $\text{var}(aX+b)=8$