REPUBLIQUE DU CAMEROUN
Paix – Travail – Patrie

MINISTERE DES FORETS ET DE LA FAUNE

SECRETARIAT GENERAL

CELLULE DE L'ENSEIGNEMENT

REPUBLIC OF CAMEROON
Peace – Work – Fatherland

MINISTRY OF FORESTRY AND WILDLIFE

SECRETARIAT GENERAL

EDUCATION UNIT

NATIONAL FORESTRY SCHOOL MBALMAYO ENTRANCE EXAMINATION, (62ST Batch 2009 -2011)
AUGUST 2008 SESSION

CYCLE "B2": Senior Forestry Technicians (TSEF)

SUBJECT: MATHEMATICS
Time allowed: 4 hours
Coefficient: 5

Exercise I

For each question, write on your answer sheet the number of the question followed by the letter that corresponds to the right answer. No justification is needed.

1. The price of an article increases by 10% and then reduces by 10%.
a) The new price is higher b) The new price is lower c) The price remains unchanged
d) It remains the same even when reduced by 10% and then increased by 10%.

2. Given that A and B are two events such that p(A) = 1/8, p(B)=2/3 and p(AUB)=$\frac{19}{24}$ therefore p(A∩B) is equal to

a) $\frac{19}{24}$ b) $\frac{2}{24}$ c) 0 d) 1

3. Two unbiased dice with sides numbered from 1 through 6 are thrown. The probability to obtain a sum equal to four is :

a) $\frac{4}{36}$ b) $\frac{3}{36}$ c) $\frac{2}{36}$ d) $\frac{1}{36}$

4. The set $\begin{cases} x+y-z=1 \\ x-y+z=5 \\ -x+y+z=3 \end{cases}$ has as solution

a) (1,1,1) b) (3,5,7) c) (4,2,5) d) (3,2,4)

5. The number 3ln4-ln 12 is equal to

a) 0 b) ln 52 c) ln $\frac{16}{3}$ d) 3 ln4-ln3

6. The function f defined by $f(x)= \ln(\ln x)$ has as domain by definition:

a) $]1, +\infty[$ b) $]0, +\infty[$ c) $]0, 1[$ d) $]0, 1[\cup]1, +\infty[$

7. The equation lnx = -5:

a) Has no solution b) has as solution e^5 c) has as solution e^{-5} d) Has as solution $\frac{1}{e-5}$

8. The equality of $2\ln(3-x) - \ln(x+2) = \ln\left(\frac{(x-3)2}{x+2}\right)$ is true for all elements in x :

a)]-2, 3[b)]0, +∞[c)]-2, +∞[d)]3,+∞[

9. The derivative of the function defined by $f(x) = x\ln x$ is given by :

a) $f'(x)=\frac{1}{x}$ b) $f'(x)= \ln x - 1$ c) $f'(x)= \ln x + 1$ d) $f'(x)= \ln x$

10. The origin of]1, +∞ [of the function defined by $f(x) = \frac{1}{x\ln x}$ is given by :

a) $F(x)=\frac{1}{\ln x}$ b) $F(x) = \frac{-1}{\ln x}$ c) $F(x)=\frac{\ln x}{x}$ d) $F(x)= \ln(\ln x)$

Exercise II (6 marks)

No justifications are required.

If f is a function defined on [0, +∞ [by $f(x) = x\ln x - x$, for $x \neq 0$ and $f(0) = 0$.

1. The limit of f at +∞ is equal to

a) 0 b) +∞ c) +∞ d) 1 0.5mark

2. The derived function f is given by:

a) $f'(x)= \ln x$ b) $f'(x)= \ln x + 1$ c) $f'(x)= \ln x - 1$ d) $f'(x)= -\ln x$ 0.5mark

3. One of the tables shows the variation of f. which one is it? 0.5mark

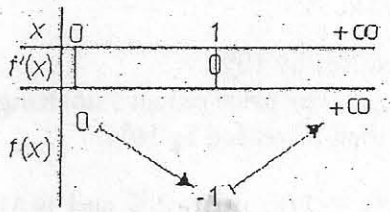


Table 1

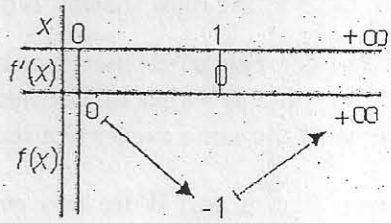


Table 2

4. Recopy and complete the following table below (given the value to approximately 2d.p.)

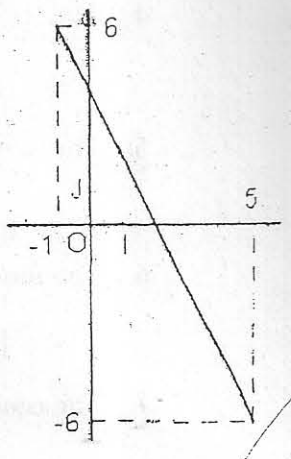
x	0.5	0.75	1	1.25	1.5	2	e	3	4	5
$f(x)$			-1	-0.93	0.29	-0.61	0	0.90	1.55	3.04

5. Trace the curve (C) which is a representative of the function f. Consider 2cm per unit on each axis. (2 marks)

Exercise III (4 marks)

No justifications are required.

The segment on the right adjacently is a graphical representation of a derived function g defined on [-1, 5].



A. Answer yes(Y) or no (N).

1. $g'(-1) < g'(0)$. 0.5mark
2. $g(-1) < g(0)$. 0.5mark
3. The function g increases on [2, 5]. 0.5mark
4. G is a third degree polynomial. 0.5mark

B. 1. We know that $g(2) = 3$. Therefore g(x) is equal to

a) $x^2 - 4x + 7$ b) $x^2 - 1$ c) $-x^2 + x - 1$ d) $-x^2 - x + 9$ 1mark

2. Draw a variation table of g. No study of the function is required. 1mark