MINISTRY OF EDUCATION AND HIGHER EDUCATION

FORM FOUR EXAMS, 2012

MATHEMATICS

P/LAND NATIONAL EXAMINATION BOARD

PUNTLAND STATE OF SOMALIA

MINISTRY OF EDUCATION

NATIONAL EXAMINATIONS BOARD

NAME OF THE STUDENT	
NAME OF THE SCHOOL	
ROLL NUMBER	

FORM FOUR MATHEMATICS EXAMINATION May 2012

TIME 2:10 HOURS

INSTRUCTIONS TO CANDIDATES

Instructions to the candidate (please read carefully)

This paper consist of 16 pages, count now, if there is missing please inform to the invigilator

- Answer ALL question
- Write your working on the space provided below the question
- No allowed extra paper
- No allowed calculators
- If you write wrong answer please delete and write right the answer clearly
- This paper consist of two parts
- **PART A: (10 multiple choices) = 10 marks**
- **PART B: (10 structured questions) = 90 marks**

Total = 100 marks

Use this page for rough work, it will not be marked

PART A: MULTIPLE CHOICE (10 marks)

Circle the correct answer, if you change your mind please cross out the wrong answer and circle the correct answer clearly

(each question carries 1 mark)

1. The lowest common multiple LCM of 6, 12 and 15 is
   a) 30
   b) 72
   c) 60
   d) 80

2. $^{10}P_2$ is equal to
   a) 45
   b) 90
   c) 80
   d) 50

3. Cos2A is equal to
   A) 2SinACosA
   B) Sin2ACos2A
   C) $1- 2\sin^2 A$
   D) $1 - \cos^2 A$

4. (9 − 2i) - (2 + 4i) is equal to

a) 2 − 3i
b) 7 − 6i
c). 8 - 4i
d). 11 − 2i

5. If f(x) = $\frac{3x-5}{4}$ then f(3) is equal to

a) 4
b) 5
c). 3
d). 1

6. $\frac{d}{dx}(\sec x)$ is equal to

a) Cosx

b) secxsinx

c). sinxtanx

d). secxtanx

7. The median of this data 10, 3, 9, 8, 4, 5, 7 is

a) 7 b) 5 c). 4 d). 6

8. Written as stander form (scientific notation) 725000 is

a) $7.25x10^3$

b) $7.25x10^5$

c) $7.25x10^2$

d) $7.25x10^4$

9. If A = { 2, 3, 4, 5, 6,7} and B = {4, 6, 2, 8, 9} then $A \cap B$ is

a) {1, 3, 5)

b) {2, 4, 6}

c) {4, 6, 8}

d) {4, 6, 9}

10. $\int Sec2xdx$ is equal to

a) Cotx +c

b) secx + c

c) tanx + c

d) Cscx + c

PART 2: STRUCTRED QUESTIONS (90 marks)

Answer ALL questions, you must show ALL your workings in the space provided

Question 1

a) Evaluate $\frac{-8\div2+12\times3-4\times6}{42\div7\times3}$ (2 marks)

b) A trade bought a book 625 sh and late sold it at 875 sh. Find his percentage profit (2marks)

Question 2

a) Solve by factorization only $x^2 - 5x - 36 = 0$ (2marks)

b) Log103 = 0.4771 and Log102 = 0.3010 Find Log109 x Log104

Question 3

a) If universal set ξ = {odd number between 10 and 20} and

A = { prime numbers between 10 and 20}

B = { multiples of 3 between 10 and 20}

Write the members of the following

i) A = { .....) (2marks)

ii) B = { .....) (2marks)

iii) $A \cap B$ = { .....) (1marks)

iv) $A \cup B$ = { .....) (2marks)

Question 4

a) If $A = \begin{pmatrix} 3 & 1 \\ -2 & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 4 & -1 \\ 2 & 3 \end{pmatrix}$ Find

i) $3A - B$ = (2marks)

ii) |B| Determinant of B

(2marks)

iii) (A^{-1}) Inverse of A

(3marks)

iv) A x B =

(3marks)

b) If the vector a = $\begin{pmatrix} 10 \\ 6 \end{pmatrix}$ and vector b = $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$ Find

i) $\frac{1}{2}\vec{a} + \vec{b}$ (3marks)

ii) |b| magnitude or length of vector b

Question 5

The frequency distribution table below represents ages of 40 teachers in a school

a) Complete the table (3marks)

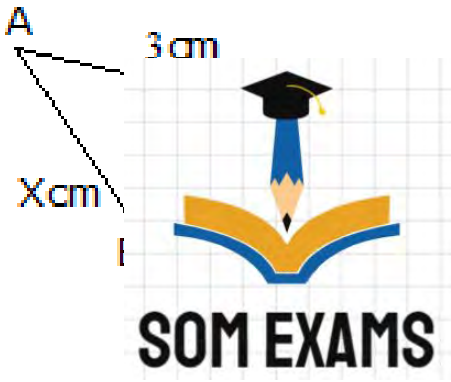
Ages in years	Frequency f	Mid pint x	fx
21 – 24	3	22.5	3 x 22.5 = 67.5
25 – 28	8		
29 – 32	12		
33 – 36	10		
37 - 44	7		
	$\sum f$ = ...		$\sum fx$ = ...

b) Which is the model class ..... (1marks)

c) Calculate the mean age (3marks)

Question 6

a) In the triangle below find side AB (3marks)
(hint: use cosine rule, Cos80° = 0.1736)



b) If $f(x) = \frac{2x+4}{5}$

i) Find f(3) (2marks)

ii) Find inverse of f(x) (3marks)

Question 7

a) The velocity of a particle moving on a straight line is given by $V = 3t2 - 2t + 9$, t in seconds and S in meters.

i) Find the acceleration of the particle when t = 3 seconds (2marks)

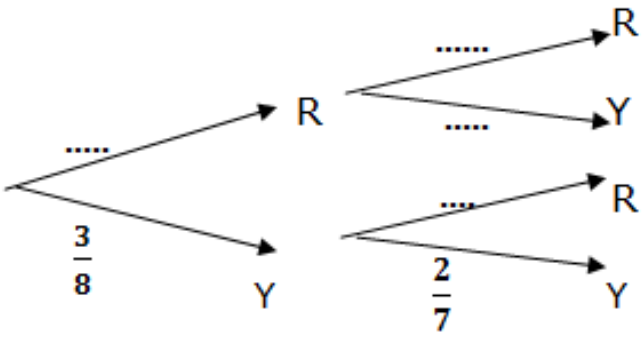
ii) Find the total distance moved by the particle between t = 1 and t = 4 (3marks)

Question 8

a) Use binomial theorem and pascals triangle to expand $(2x + y)^5$ (3maraks)

b) In a box 5 red balls and 3 yellows. Yahye drawn two balls at random without replacement

i) Complete the tree diagram below (2marks)



ii) What is the probability that the two balls will be red (2marks)

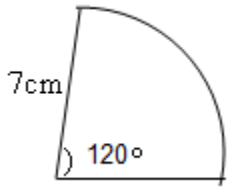
iii) What is the probability that the two balls will be same colour (3marks)

Question 8

a) prove this identity $\frac{2}{1+Sinx}+\frac{3}{1-Sinx}=6Sec^2x$ (3 marks)

b) The minor arc of a circle of radius 7cm subtends an angle of 45° at the center of the circle

i) Convert 120° to radian (2marks)



ii) Find the length of the arc (2marks)

iii) Find the perimeter of the sector (2marks)

c) Solve the trigonometric equation

$2\cos^2\theta+\cos\theta-1=0$ for $0\le\theta<2\pi$ (3m

Question 9

a) Find the gradient of the curve $y = x^3 - 3x^2 - 9x + 12$ at $x = 0$ (2marks)

b) Find the maximum and minimum coordinates of the curve $y = x^3 - 3x^2 - 9x + 12$

(4marks)

c) Find the area enclosed between the curve $y = x^3$ and X-axis and lines $x = 0$ and $x = 2$

Question 10

a) The center of a circle is (3, -2) and radius 9 Find the full equation of the circle (3marks)

b) If the equation of a parabola is $(x - 7)^2 = 24(y+4)$

i) Find the vertex (2marks)

ii) Find the focus (2marks)

iii) Find equation of the directix (2marks)

END