INTI
INTERNATIONAL COLLEGE PENANG (507232-U)
LAUREATE INTERNATIONAL UNIVERSITIES

FINAL
Examination Paper

(COVER PAGE)

Session	:	January 2012
Programme	:	Diploma in Information and Communication Technology
Course	:	**MAT1103 : Fundamentals of Mathematics**
Date of Examination	:	7 March 2012
Time	:	11a.m. – 1p.m. Reading Time : Nil
Duration	:	2 Hours
Special Instructions	:	

This paper consists of **FIVE (5)** questions. Answer any **FOUR (4)** questions in the answer bookle provided. All questions carry equal marks.

Materials permitted :
Non-Programmable Calculator

Materials provided :
Formula Booklet 1

Examiner(s)	:	**Kumatha Thinakaran**
Moderator	:	**Ng Ci Xiang**

This paper consists of 6 printed pages, including the cover page.

INTI INTERNATIONAL COLLEGE PENANG

DIPLOMA IN INFORMATION AND COMMUNICATION TECHNOLOGY (DICTN)

MAT 1103: FUNDAMENTALS OF MATHEMATICS
RESIT EXAMINATION : JAN2012 SESSION

Instructions: This paper consists of **FIVE (5)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Question 1 (25 marks)

(a) Simplify each expression. Assume that all variables represent positive number.

(i) $\dfrac{\sqrt{180ab^4}}{\sqrt{5ab^2}}$

(2 marks)

(ii) $\dfrac{-12x^2y^3z^2}{18x^3y^4z^2}$

(2 marks)

(iii) $\dfrac{2x^2+7x+3}{4x+12}$

(2 marks)

(b) Perform the operation and simplify if necessary. Write all the answers without negative exponents.

(i) $\dfrac{u^2+5u+6}{u^2-4} \cdot \dfrac{u^2-5u+6}{u^2-9}$

(2 marks)

(ii) $\dfrac{3x}{x-1} - \dfrac{2x^2+3x-2}{(x+1)(x-1)}$

(2 marks)

(iii) $\dfrac{4x^2+24x+32}{16x^2+8x-48}$

(2 marks)

(c) A 30 meter steel beam is to be cut into two pieces. The longer piece is to be 2 meter long than 3 times as long as the shorter piece. Find the length of each piece.

(5 marks)

(d) Solve each inequality. Give each result in set notation and graph it.

(i) $-4 \leq -2(x \div 8) \leq 8$

(4 marks)

(ii) $\left|\frac{3}{\div}x \div 2\right| - 1 > 3$

(4 marks)

Question 2

(a) In Figure 2 below, the equation of the straight line CDEF is $2y + 3x = 21$. The points G and F lies on the x-axis and the point D lies on the y-axis.

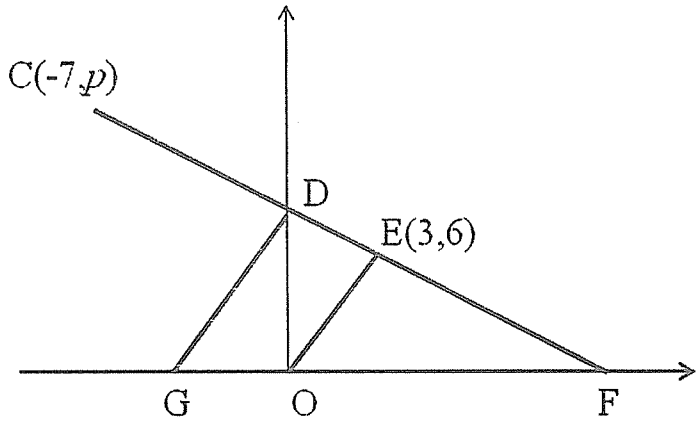

Figure 2

Find

(i) value of p

(3 marks)

(ii) the y-intercept of CDEF

(3 marks)

(iii) the gradient of OE

(2 marks)

(iv) the equation of the straight line GD, given that GD is parallel to OE

(2 marks)

(b) If P(1,2), Q(4,4) and R are on a straight line and P is the midpoint of QR, find the coordinate of the point R.

(2 marks)

(c) The function W is defined as

$$w(x) = \frac{5}{2-x}, x \neq 2.$$

Find

(i) $w^{-1}(x)$

(2 marks)

(ii) $w^{-1}(4)$

(1 mark)

(d) Sketch the graph of $f(x) = 2x^2 + x - 6$.

(10 marks)

Question 3

(a) Solve each of the following equations

(i) $2^{x+3} = 56 + 2^x$

(2 marks)

(ii) $\log_3 x = \log_9(7x + 18)$

(3 marks)

(b) The population of a village at the beginning of 1970 was 2000. The population after a period of n years is $2000(1.1)^n$.

(i) Find the population of the village at the village at the beginning 1980.

(2 marks)

(ii) At the beginning of which year, the population exceeded 20000 for the first time?

(3 marks)

(c) Given $\log_a x = m$ and $\log_a y = n$. Find

(i) $\log_a x^3 y$

(2 marks)

(ii) $\log_a \frac{y^2}{x}$

(2 marks)

(iii) $\log_a \sqrt{\frac{x^2}{a^2 y}}$

(2 marks)

(d) Solve each inequality. Represent your answer on a number line.

(i) $\frac{3x}{7} - 2 < -3$

(4 marks)

(ii) $|4z + 1| \geq 5$

(5 marks)

Question 4

(a) Perform the indicated long division

$$\frac{3x^3 - 5x^2 + 10x - 3}{3x + 1}$$

(5 marks)

(b) Solve the linear system

$$4x - 3y = 25$$
$$-3x + 8y = 10$$

(4 marks)

(c) Graph the system of linear inequalities

$$y \leq x + 5$$
$$2x + y \leq 7$$

(5 marks)

(d) Solve the simultaneous equations

$$x - y = 3$$
$$x^2 + 2y = 10$$

Give your answers correct to 3 decimal places.

(5 marks)

(e) The Figure 3 below shows an isosceles triangle of height 4cm. Given that the perimeter of the triangle is 40cm and its area is 38.4cm^2. Find the value of x and y. Give your answer in 1 decimal point.

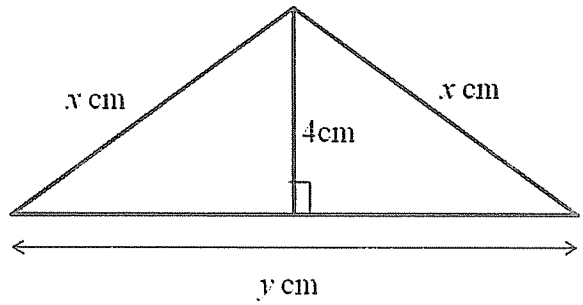

Figure 3

(6 marks)

Question 5

(a) Find the first six terms and the 300^{th} term of the arithmetic sequence

13, 7, 1, ……..

(9 marks)

(b) An amphitheater has 50 rows of seats with 30 seats in the first row, 32 in the second row, 34 in the third and so on. Find the total number of seats.

(3 marks)

(c) Find the sum of the arithmetic series

-11, -7, -3, 1, ……

from the 11^{th} term to the 20^{th} term.

(5 marks)

(d) Each year the price of a car depreciates by 10% of the value at the beginning of the year. If the original price of the car was RM 50000, find its price after 10 years.

(4 marks)

(e) Solve the following

(i) Find the 9^{th} term of geometric sequence

27, 9, 3, …….

(2 marks)

(ii) Find S_{10} of the geometric sequence above

(2 marks)

--THE END--

<MAT 1103/(F)/Jan 12/ Kumatha Thinakaran /270212>