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

FINAL
Examination Paper

(COVER PAGE)

Session	:	JANUARY 2013
Programme	:	DIPLOMA IN BUSINESS ADMINISTRATION
Course	:	**MAT1112 : Basic Mathematics 2**
Date of Examination	:	5 March 2013
Time	:	2.00pm- 4.00pm Reading Time : Nil
Duration	:	2 hours
Special Instructions	:	

This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Materials permitted :

Non-Programmable Scientific Calculator

Materials provided :

Formula Booklet 1

Examiner(s) : **Bark Chee Beng**

Moderator : **Ng Ci Xiang**

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

INTI INTERNATIONAL COLLEGE PENANG

DIPLOMA IN BUSINESS ADMINISTRATION
MAT 1112: BUSINESS MATHEMATICS 2

FINAL EXAMINATION: JANUARY 2013 SESSION

This paper consists of **SIX (6)** questions. Answer any **FOUR (4)** questions in the answer booklet provided. All questions carry equal marks.

Question 1

(a) Simplify:

(i) $5\sqrt{147} - 4\sqrt{27}$

(2 marks)

(ii) $\left(a^{\frac{4}{3}}b^{\frac{1}{2}}\right)^{6}\left(a+b^{\frac{1}{2}}\right)$

(4 marks)

(b) Solve the equation: $x - 3 = 4\sqrt{x+2}$.

(5 marks)

(c) Rationalize the denominator $\dfrac{3}{3\sqrt{2}-\sqrt{5}}$.

(3 marks)

(d) Simplify the following expressions into a single fraction :

(i) $\dfrac{x-2}{2x-3} - \dfrac{2x-3}{x-2}$

(4 marks)

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

(4 marks)

(iii) $\dfrac{12x}{18x+3} \div \dfrac{3}{12x+2}$.

(3 marks)

Question 2

(a) Let $P(x) = 3x^3 + x^2 - 5x + 10$.

(i) Find the remainder when $P(x)$ is divided by $(x - 3)$.

(3 marks)

(ii) Prove that $(x + 2)$ is the factor of $P(x)$.

(3 marks)

(iii) Hence, use synthetic division to do the division of $P(x)$ by $(x + 2)$.

(4 marks)

(b) The velocity υ of a falling object is directly proportional to the time t of the fall. If, after 2 seconds, the velocity of the object is 64 meters per second, what will its velocity be after 5 seconds, assuming that the object is yet to touch the ground?

(3 marks)

(c) Given $f(x) = 2x^2 + 4x - 3$.

(i) Write $f(x)$ in the form $y = a(x - h)^2 + k$.

(3 marks)

(ii) Find the vertex.

(2 marks)

(iii) Find the x-intercept and y-intercept (if any).

(3 marks)

(iv) Sketch the graph of $y = f(x)$.

(4 marks)

Question 3

(a) Solve the following equation:

(i) $4 + \frac{1}{x} - \frac{1}{x^2} = 0$

(5 marks)

(ii) $\frac{8x + 5}{10x - 7} = \frac{4x - 3}{5x + 7}$

(4 marks)

(iii) $\frac{4}{x} - 5 = \frac{5}{2x}$

(3 marks)

(b) Solve the following inequalities:

(i) $x^2 - x - 6 > 0$

(4 marks)

(ii) $\dfrac{2x-1}{x+2} < 0$

(3 marks)

(iii) $\dfrac{-1}{x-3} > \dfrac{2}{x+3}$.

(6 marks)

Question 4

(a) Let $f(x) = \sqrt{x+5}$ and $g(x) = 3x + 2$. Find each of the following functional values:

(i) $f(-1)$

(2 marks)

(ii) $f(20).g(3)$

(2 marks)

(iii) $g^{-1}(2)$

(4 marks)

(iv) $g^{-1}f(11)$

(3 marks)

(b) Expand $(3x + y)^4$.

(4 marks)

(c) Find the 8th term of the expansion of $(2x + \dfrac{2}{x})^{12}$.

(4 marks)

(d) Using appropriate transformations, sketch the graph for the following functions :

(i) $y = 2(x+2)^2 + 2$

(4 marks)

(ii) $y = (\log_5 x) + 2.$

(2 marks)

Question 5

(a) The 8th term of an arithmetic sequence is 8 and the 21st term is 47.

(i) Find its common difference and the first term.

(4 marks)

(ii) Find the sum of the first 28 terms.

(3 marks)

(b) Let $2, -\frac{1}{2}, \frac{1}{8}, \ldots$ be a geometric sequence.

(i) Find the common ratio.

(2 marks)

(ii) Find the 20th term.

(3 marks)

(iii) Find the sum to infinity.

(3 marks)

(c) An exhibitor intends to arrange 5 paintings in a row on a wall. In how many ways can this be done?

(3 marks)

(d) Four students are to be chosen from a group of 20 boys and 25 girls in a class. Find the probability that exactly 2 boys and 2 girls are selected?

(3 marks)

(e) How many different arrangements can be made of the letters in the word MATHEMATICS?

(4 marks)

Question 6

(a) Kelvin will be buying a new car for RM15,000 in 3 years. How much money should he ask his parent for now that, if he invests it at 6% compounded continuously, he will have enough to buy the car?

(4 marks)

(b) What annual rate of interest is required to double an investment in 6 years?

(4 marks)

(c) Find the value of x in each of the following equations:

(i) $\log_3(3x-2)=2$

(2 marks)

(ii) $2\log_4(x-2)+\log_4 3=2$

(6 marks)

(iii) $5^{1-2x}=\frac{1}{5}$

(3 marks)

(iv) $2^x=9$

(2 marks)

(d) Assume that log 3 = 0.4771 and log 7 = 0.8451, use these values and the properties of logarithm to find log 0.021.

(4 marks)

THE END

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