



**INTI**  
International College Penang  
LAUREATE INTERNATIONAL UNIVERSITIES\*

**FINAL**  
Examination Paper

(COVER PAGE)

Session : April 2017

Programme : Certificate In Business Studies (CBSI)

Course : **MAT1001: Mathematics**

Date of Examination : 31 July 2017 (Monday)

Time : 2:00pm – 4:00pm Reading Time : Nil

Duration : 2 Hours

**Special Instructions** :

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

Materials permitted :  
Non-Programmable Scientific Calculator

Materials provided :  
Nil

Examiner(s) : Ng Ci Xiang

Moderator : Dr. Ch'ng Pei Eng

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

INTI INTERNATIONAL COLLEGE PENANG  
CERTIFICATE IN BUSINESS STUDIES (CBSI)  
MAT1001: MATHEMATICS  
FINAL EXAMINATION: APRIL 2017 SESSION

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

**Question 1**

- (a) Let  $a = 1$ ,  $b = 3$ ,  $c = 5$  and  $d = -2$ , evaluate the value for
- (i)  $(a - b) - (c - d)$  (2 marks)
- (ii)  $2c(8a - 2d) + ab$  (2 marks)
- (iii)  $\frac{b(a - c)}{2cd - (c - a)}$  (2 marks)
- (b) Solve each equation.
- (i)  $2x - 4(5x + 1) = 3x + 17$  (2 marks)
- (ii)  $\frac{x}{4} = 2 + \frac{x - 3}{3}$  (2 marks)
- (c) Determine which number(s) in the set  $\{-3, 0, \sqrt{4}, -4, 5, 7, \sqrt{3}, \frac{4}{3}, \sqrt{7}, 11\}$  are in each category listed below?
- (i) Whole numbers (3 marks)
- (ii) Prime numbers (3 marks)
- (iii) Irrational numbers (2 marks)
- (d) Given two points,  $A(-1, 5)$  and  $B(4, 15)$ .
- (i) Find the midpoint of  $AB$ . (2 marks)
- (ii) Find the slope of  $AB$ . (2 marks)
- (iii) Find the equation of  $AB$ , express your answer in general form. (3 marks)

**Question 2**

- (a) Simplify the expression below. Assume all variables are not zero and write your answer without negative exponents.

$$\frac{(3x^3y^2)^{-1}}{(xy^2)^{-5}}$$

(4 marks)

- (b) Solve the system by using substitution method.

$$\begin{cases} x - y = 4 \\ 3x + 7y = -18 \end{cases}$$

(5 marks)

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

(i) Find the value of  $f(-2)$ . (2 marks)

(ii) Find  $(f \circ g)(x)$  and  $(f \circ g)(2)$ . (4 marks)

- (d) Solve  $\frac{2x}{x+1} - \frac{3}{x-3} = 2$ . (6 marks)

- (e) Find the equation of the line that passes through the points  $P(1, 2)$  and  $Q(2, -8)$ , write your answer in slope-intercept form. (4 marks)

## Question 3

(a) Given:

Line A:  $y = 5 - 2x$

Line B:  $2y - x = 8$

Determine whether the line A and B are parallel, perpendicular or neither. (3 marks)

(b) Simplify the expression below. Assume that the variable is a positive number and write your answer without negative exponents.

$$\frac{x^{-2}x^9}{(2x^2)^3}$$

(3 marks)

(c) Write each of the following in scientific notation.

(i) 825000000 (1 mark)

(ii) 0.00006571 (1 mark)

(d) Solve the system of equations below.

(i) 
$$\begin{cases} 3(x + y) = 6 \\ 3(x - y) = -36 \end{cases}$$
 (4 marks)

(ii) 
$$\begin{cases} 3x + 2y = 3 \\ 9x^2 + y^2 = 9 \end{cases}$$
 (5 marks)

(e) Factor each of the following completely.

(i)  $2xy - 4x^2y^2$  (2 marks)

(ii)  $8x^3 - 40x^2 - 48x$  (3 marks)

(iii)  $2x^2 - 50y^2$  (3 marks)

**Question 4**

- (a) A company receives RM45 for each unit of product sold. It has a variable cost of RM25 per item and a fixed cost of RM1600.
- (i) Find the profit function,  $P(x)$ . (3 marks)
- (ii) What is the profit if the company sells 200 unit of products? (2 marks)
- (b) Find the equation of line passing through  $(-8, -10)$  and parallel to the line  $y + 4x = 3$ , leave your answer in general form. (4 marks)
- (c) Expand the followings:
- (i)  $4xy(7x + 3y)$  (3 marks)
- (ii)  $(x - 2)(x^2 + 2x + 4)$  (4 marks)
- (d) Solve the equation  $3x^2 + 10x - 8 = 0$ . (3 marks)
- (e) Given  $f(x) = 2x^2 + 1$  and  $g(x) = 2 - x^2$ .
- (i) Find the value of  $g(-3)$ . (2 marks)
- (ii) Find  $(f - g)(x)$  and  $(f - g)(0)$ . (4 marks)

**Question 5**

(a) Factorise the followings completely:

(i)  $8x^2 - 8y^2$  (3 marks)

(ii)  $x^3 - 7x^2 - x + 7$  (4 marks)

(b) Solve the following inequalities:

(i)  $4(x+1) + 2 \geq 3x + 6$  (3 marks)

(ii)  $5x + 20 < 0$  and  $3x > -18$  (3 marks)

(c) Solve the equation  $2x^2 - 7x - 10 = 0$  by using quadratic formula below and round off your answer into 3 significant figures.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

(3 marks)

(d) Solve  $|3x - 1| + 10 = 15$ . (4 marks)

(e) Find the equation of the line passing through  $(5, -9)$  and perpendicular to the line whose equation is  $x + 7y = 12$ , leave your answer in slope-intercept form. (5 marks)

~ **The End** ~

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