



INTI
International College Penang

FINAL
Examination Paper

(COVER PAGE)

Session : April 2018

Programme : CERTIFICATE IN BUSINESS STUDIES (CBSI)

Course : MAT1001 : MATHEMATICS

Date of Examination : 31 July 2018 (Tuesday)

Time : 11:00AM – 1:00PM Reading Time : Nil

Duration : 2 Hours

Special Instructions :

This paper consists of **TWO (2)** sections.

Section A: Answer **ALL** the questions in the OMR sheet provided

Section B: This section consists of **FIVE (5)** questions. Answer any **THREE (3)** questions in the answer booklet provided.

Materials permitted :

Non-Programmable Calculator

Materials provided :

OMR & Answer booklet

Examiner(s) : Mr. Michael Chong Sueng Lock

Moderator : Dr. Ch'ng Pei Eng

*This paper consists of **10** printed pages, including the cover page.*

INTI INTERNATIONAL COLLEGE PENANG
CERTIFICATE IN BUSINESS STUDIES (CBSI)
MAT1001: MATHEMATICS
FINAL EXAMINATION: APRIL 2018 SESSION

Section A (40 marks)

Instructions: This section consists of **twenty (20)** questions. Answer **ALL** questions in the OMR sheets provided.

1. Which of the following is a rational number?

I. $\frac{2}{5}$	II. $\sqrt{9}$
III. -5	IV. $\sqrt{7}$

A. I & II
B. I & III
C. I, II & III
D. III & IV

2. Which of the following is the proper scientific notation for 660,000,000?

A. 6.6×10^8
B. 6.6×10^7
C. 6.6×10^9
D. 66×10^7

3. Which of the following is decimal notation for 2.01×10^5 ?

A. 20100
B. 201000
C. 2010000
D. 2010

4. Given $f(x) = 3x^2 - 2$, find $f(-2)$.

A. -14
B. 14
C. 10
D. -10

10. Given that $R(x)$ is the revenue function and $C(x)$ is the cost function. Which of the following shows a loss?
- A. $R(x) > C(x)$
 - B. $R(x) < C(x)$
 - C. $R(x) - C(x) = 0$
 - D. None of the above
11. A company sells a T-shirt at a price of RM 40 while the fixed cost is at RM 1000 and the cost per T-shirt is RM 18. Which of the following shows the profit function?
- A. $40x$
 - B. $1000 + 18x$
 - C. $40x - 1000$
 - D. $22x - 1000$
12. A bag is sold at RM 80 while the fixed cost is at RM 2000 and the cost per bag is RM 30. What is the break-even point?
- A. 40
 - B. 30
 - C. 80
 - D. 50
13. Find the union of set $A = \{-3, 2, 6, 8, 9\}$ and set $B = \{-4, 0, 1, 6, 9\}$.
- A. $\{-4, -3, 0, 1, 2, 6, 8, 9\}$
 - B. $\{6, 9\}$
 - C. $\{-4, -3, 0, 1, 2, 8\}$
 - D. None of the above
14. There are two types of cell phone plan. Plan A cost RM 50 with RM 0.20 per SMS. Plan B cost RM 20 per month with RM 0.50 per SMS. If x represents the SMS sent, what is the value of x at which Plan B is more expensive than Plan A.
- A. $x > 50$
 - B. $x > 100$
 - C. $x > 200$
 - D. $x > 300$

15. Find the intersection of set $A = \{-1, 2, 3, 5, 8\}$ and set $B = \{-1, 0, 1, 2, 5\}$.
- A. $\{-1, 0, 1, 2, 3, 5, 8\}$
 - B. $\{-1, 2, 5\}$
 - C. $\{0, 1, 3, 8\}$
 - D. None of the above
16. Which is the correct expression for a trinomial?
- A. x^2
 - B. $x^2 + 3x + 2x^2$
 - C. $x^2 + 4x + 2$
 - D. $x^2 + 3x - 4x$
17. The polynomial $x^3y^2 + 3x^2 + 2y^2$ has a degree of?
- A. 2
 - B. 3
 - C. 4
 - D. 5
18. The expression $(3x + 5)^3$ is expanded into?
- A. $3x^3 + 125$
 - B. $27x^3 + 125$
 - C. $27x^3 + 135x^2 + 225x + 125$
 - D. $3x^3 + 9x^2 + 3x + 125$
19. What is the roots of the equation $3x^2 + 11x + 6 = 0$?
- | | |
|-----------|-----------|
| I. $-2/3$ | II. 3 |
| III. -3 | IV. $2/3$ |
- A. I & II
 - B. I & III
 - C. II & III
 - D. III & IV

20. What are the roots of the equation $x^2 - x + 6 = 0$?

I. $\frac{1 + \sqrt{23}}{2}$

II. $\frac{1 + \sqrt{-23}}{2}$

III. $\frac{1 - \sqrt{-23}}{2}$

IV. $2 \frac{1 + \sqrt{23}}{2}$

- A. I & II
 B. I & III
 C. II & III
 D. III & IV

Section B (60 marks)

Instruction: This section consists of **FIVE (5)** questions. Answer any **THREE (3)** questions in the answer booklet provided.

Question 1

(a) Given that $a = 3$, $b = 4$, $c = -2$ and $d = 5$, evaluate the following:

(i) $\frac{ad - bc}{a^2}$ (2 marks)

(ii) $2a(3b - c)$ (2 marks)

(iii) $ac + (b - d)$ (2 marks)

(b) Simplify the following expression and write your answer without negative exponents.

$$\frac{15x^2y^3z^{-1}}{3xy^2z^4} \quad (4 \text{ marks})$$

(c) Solve the following equations:

(i) $\frac{3x}{4} + \frac{x-3}{2} = \frac{1}{8}$ (3 marks)

(ii) $3(3x - 4) = 4x + 3$ (3 marks)

(d) Sketch the graph of the equation $3y = 6x + 9$. (4 marks)

Question 2

- (a) Determine which number(s) in the set $\{-3, 0, \sqrt{16}, \sqrt{8}, \frac{1}{2}, 18, \pi, 11\}$ are in each category listed below.
- (i) Prime numbers. (2 marks)
 - (ii) Irrational numbers. (2 marks)
 - (iii) Whole numbers. (2 marks)
- (b) If $f(x) = 3x + 5$ and $g(x) = 2x - 7$, find
- (i) $f(3)$. (2 marks)
 - (ii) $(f \circ g)(x)$. (3 marks)
- (c) Using the substitution method, solve the following system of linear equations.
- $$\begin{aligned} 3x + y &= 9 \\ x - 2y &= -4 \end{aligned}$$
- (5 marks)
- (d) Given two points, $A(2, -6)$ and $B(-10, -15)$.
- (i) Find the midpoint of AB . (2 marks)
 - (ii) Find the slope of the line AB . (2 marks)

Question 3

(a) Given:

$$\text{Line A: } y - 3x + 2 = 0$$

$$\text{Line B: } 3y + x = 24$$

Determine if the two lines are parallel, perpendicular or neither. (3 marks)

(b) Write the following in scientific notation:

(i) 8350000 (1 mark)

(ii) 0.0000263 (1 mark)

(c) Solve the following system of equations below:

(i)
$$\begin{cases} x + 2y = 8 \\ 2x - y = 1 \end{cases}$$
 (4 marks)

(ii)
$$\begin{cases} x + y = 6 \\ 2x^2 - y^2 = 9 \end{cases}$$
 (5 marks)

(d) A company produces car child seats to be sold at a price of RM 180 with an estimate cost (in RM) of producing x child seats given by $C(x) = 1000 + 25x$.

(i) Find the profit function. (3 marks)

(ii) Find the profit if 200 units of the car child seats are produced and sold. (3 marks)

Question 4

- (a) Expand the following expression:
- (i) $3xy(2x - 7y)$ (3 marks)
 - (ii) $(2x + 3)(2x^2 + x - 2)$ (4 marks)
- (b) Solve the equation $2x^2 + x - 6 = 0$. (3 marks)
- (c) Given the functions $f(x) = x^2 + 5$ and $g(x) = 2x^2 - 7$, find
- (i) $f(-3)$. (2 marks)
 - (ii) $(f - g)(x)$ and $(f + g)(0)$. (4 marks)
- (d) Solve the inequalities $|3x - 1| + 5 > 10$. (4 marks)

Question 5

(a) Solve the following inequalities:

(i) $-1 < 2(3 - x) \leq 6$ (4 marks)

(ii) $|-6 + 3x| > 8$ (4 marks)

(iii) $|2x - 4| + 4 \leq 8$ (4 marks)

(b) Using the quadratic formula given below, solve the equation $2x^2 + 3x - 7 = 0$ and give your answer correct to 4 decimal places.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \quad (4 \text{ marks})$$

(c) Find the equation of the line that passes through the point $(4, -2)$ and is parallel to the line $y - 5x = 8$.

(4 marks)

~ The End ~

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