BUKIT SION MIDDLE SCHOOL

NATIONAL PLUS

END OF SEMESTER 1 EXAMINATION *Where the abundance in life flows…….*

Subject : MATHEMATICS **Grade: 7 - ……**

Day/Date: FRIDAY, 11 DECEMBER 2015 **Name: ……**

GENERAL INTRUCTIONS:

1. **Write your name** in all of the papers you hand in.
2. Answer **all** questions. Use **black** or **blue** pen.
3. **Read carefully** the instructions for each section.
4. **DO NOT USE A CALCULATOR.**
5. Write your answers on the space provided in the question paper.

   Marks may be deducted if necessary working is not shown/clear.
6. Do not use correction tape or highlighter in this test.
7. The number of marks is given in brackets [] in each section and/or at the end of the question.

8. **DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.**

For Teacher's Use	
Section A	**/ 30**
Section B	**/ 40**
Section C	**/ 30**
TOTAL	**/ 100**

SECTION A: CONCEPTS [30 MARKS]

I. MULTIPLE CHOICE [10 marks each]

Write the CAPITAL letter of your choice inside the brackets provided on the right.

1. *Three less than twice a number"* when translated is: ( )

   (A) $3 - 2x$ (B) $3 + 2x$ (C) $2x - 3$ (D) $x^2 - 3$

2. The following clues imply addition, EXCEPT: ( )

   (A) total (B) sum (C) product (D) increased by

3. Which of the following statements on integers is true? ( )

   (A) The least negative integer cannot be determined

   (B) Zero is either positive or negative.

   (C) (-1.5) is an integer

   (D) $\sqrt{2}$ is an integer

4. Subtract $7x^3 - x^2 + 3x + 3$ from $4x^3 + 2x^2 - 5x + 1$. ( )

   (A) $-3x^3 + x^2 - 8x - 1$ (C) $3x^2 + 2x^2 - 6x - 2$

   (B) $3x^4 + 3x^3 + 8x^2 + 2$ (D) $-3x^3 + 3x^2 - 8x - 2$

5. What is the value of x in the equation $x + 4 = -1$? ( )

   (A) 5 (B) 3 (C) -5 (D) -3

6. What must be the value of b such that $-3b^3$ will give a value of 24? ( )

   (A) -8 (B) 8 (C) 2 (D) -2

7. Which of the following simplified expressions is NOT correct? ( )

   (A) $-(a - b) = -a + b$ (C) $5 - 2(a - b) = 3a + 3b$

   (B) $-(a + b) = -a - b$ (D) $2b - (a + b) = b - a$

8. Evaluate: $(-3)^3 \times (-1)^5$ ( )

   (a) 27 (b) -27 (c) 135 (d) -135

9. The sum of the three consecutive odd numbers given that ( )
   x is the first odd number:

   (A) $3x + 3$ (B) $3x + 8$ (C) $3x + 6$ (D) $3x$

10. The following satisfy the value of $y < -3$, EXCEPT: ( )

    (A) -8 (B) -3 (C) -100 (D) -3.2

II. TRANSLATION [4 marks]

Translate the following expressions into algebraic expressions.

1. m less than 4 _____

2. the difference of h and twice k _____

3. the quotient of the square of n and 5 _____

4. the distance covered a car traveling at 60km/h for p hours _____

III. MATCHING TYPE [3 marks]

Given that **a=1**, **b=2**, **c=0**, **x = 2**, **y = -3** and **z = 1**, match the answers in COLUMN N to the expressions in COLUMN M. Write your answer on the space provided before each number.

COLUMN M	COLUMN N
_____ 1. $-2(ab + c)$	(A) 8
_____ 2. $(x - y)^2 - (y - z)^2 - (x - z)^2$	(B) 4
_____ 3. $-2a + 3b - 4c$	(C) 3

IV. CONSTRUCTING NUMBER LINE [5 marks]

Make the number line for each of the following values of y.

1. $y \geq 5$

2. $y + 3 < 10$.

3. $-3(b + 1) < 7b + 5$

V. SHORT-ANSWER QUESTIONS [5 marks]

1. The length of a rectangle is 5 meters more than twice its width.

   If the width is x meters:

   (i) write the length of the rectangle in terms of x. _____

   (ii) write the perimeter of the rectangle in terms of x. _____

2. The cost of a dozen of notebooks is $\$z$.

   Find the price of each notebook. _____

3. There were 9 fewer English books than Mathematics books in the cabinet.

   If the number of English books is x, write:

   (i) number of Mathematics books in terms of x. _____

   (ii) total number of English and Math books _____

VI. FORMULA TRANSFORMATION [3 marks]

Transform the following formula as indicated.

1. **A = P(1 + RT)** (t)

2. $\mathbf{F = \frac{5}{9} C + 32}$ (C)

3. $\mathbf{V = \pi r^2 h}$ (r)

SECTION B: CALCULATION [40 MARKS]

Answer this section on a separate sheet of paper.
Show ALL working. Marks may be deducted if necessary working is not shown.

1. Do the operations as indicated. [4]

(a) -40 + 25 = _____

(b) (-21) – (-14)= _____

(c) -150 ÷ -6 = _____

(d) $(-3)^3 \times (-1)^5$ = _____

2. Add/Subtract the following algebraic expressions. [12]

<table>
<tr><td>(a) 2a+ 4b – (-6a) + b + (-3a) – 5a</td><td rowspan="2">(d) $8a - \{2a - [3c - 6(a - 2c)]\}$</td></tr>
<tr><td>(c) $4(x-5y)-5(2y-3x)-(2x-5y)$</td></tr>
<tr><td>(e) $\frac{2(5x-1)}{5}-\frac{x-3}{5}$</td><td>(f) $\frac{x+y}{3}-\frac{2}{5}-\frac{3x-2y}{6}$</td></tr>
</table>

3. Find the product.

(a) $(-3xy)(5x^3y)(-2xy^4)$ _____ [1]

(b) $4x(3x^2 - 2)$ _____ [1]

4. Simplify.

(a) $\frac{6a^3}{21a}$ _____ [1]

(b) $\frac{(8x^4y^2)(3xy)}{18x^3y^5}$ _____ [2]

5. Given the formula, $T + \frac{1}{2} = \frac{D}{S-17}$, transform it to solve for *S*. [3]

6. Solve the following equations. [10]

(a) $3x - 5 = x + 11$

(c) $15 - 5(x - 3) = 2(x + 3)$

(b) $\frac{3x-1}{6} = \frac{13-4x}{6}$

(d) $\frac{x+2}{2} - \frac{x-7}{5} = \frac{x+4}{10}$

7. Factorise completely.

(a) $-25y - 35$ _____ [1]

(b) $4x^2y^3 + 16x^3y^4 - 20x^4y^2$ _____ [2]

(c) $(a + b)(x + y) + (c + d)(x + y)$ _____ [1]

(d) $3by - 6bx + 2ax - ay$ _____ [2]

SECTION C: WORD PROBLEMS [30 MARKS]

Read each problem below and solve on a *SEPARATE SHEET OF PAPER*.
Show *ALL* working as clearly and neatly as possible.
Marks may be deducted if necessary working is not shown.

1. Four times the sum of a number and eleven is equal to three times the difference of the number and five. [3]

2. The breadth of a rectangle is $(4r - s)$ cm.

   Find the length of the rectangle if its area is $(8pr - 2ps + 20qr - 5qs)$ cm^2. [2]

3. Find five consecutive integers with a sum of 180. [4]

4. Marie bought two kinds of erasers: STABILO erasers that cost $5 and FABER CASTLE erasers that cost $10 each.
The number of FABER CASTLE erasers is 9 less than 4 times the number of STABILO erasers.

If the total cost of all the erasers is $630, determine the number of FABER CASTLE erasers that Marie bought.

[4]

5. Beth is 4 years older than Danny and Dino is twice as old as Beth.
Three years ago, the sum of their ages is 35.
How old are they now? [5]

6. I am thinking of two integers. The bigger number is 5 times the smaller number.
Their total is less than 78.

Find the greatest possible values of the two integers. [3]

7. On a recent bicycle trip, Barbara cycled for 5 hours.

Her bicycle then developed mechanical problem and so she walked the bicycle for 3 hours to the nearest town for repair.

Altogether, she covered 67 kilometers.

If she cycled 9 km/h faster than she walked, then how far did she walk? [4]

8. Angie is x years old.

Her sister is 12 years older than her while their mother is twice as old as her sister.

Betty is 3 years younger than Angie while Betty's mother is 4 times as old as Betty.

if Angie's mother is 6 years older than Betty's mother, then find Angie's age in 5 years.

[5]

END OF EXAM