BUKIT SION MIDDLE SCHOOL

NATIONAL PLUS

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

Subject	**: MATHEMATICS**	**Grade**	**: 7 - ……**
		Duration	**: 120 minutes**
Day/date	**: ……**	**Name**	**: ……**

ADDITIONAL MATERIALS:

Calculator (FOR SECTION A ONLY)

GENERAL INTRUCTIONS:

1. **Write your name** and **class** legibly for each paper you hand in.
2. **Read carefully** the instructions for each section.
3. Answer **all** questions.
4. **AFTER ANSWERING SECTION A, SUBMIT THE PAPER AND YOUR CALCULATOR TO THE TEACHER IN CHARGE IN EXCHANGE FOR SECTION B AND SECTION C PAPERS.**
5. Marks may be deducted if necessary working is not shown/clear.
6. The number of marks is given in brackets [] in each section and/or at the end of the question.
7. **DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.**

For Teacher's Use	
Section A	**/ 10**
Section B	**/ 30**
Section C	**/ 40**
Section D	**/ 20**
TOTAL	**/ 100**

SECTION A: USING CALCULATOR [10 MARKS]

1. Write the numbers $0.5^2, \sqrt{0.5}, 0.5^3, \sqrt[3]{0.5}$ in increasing order.

Answer: _____[2]

2. Evaluate $\dfrac{\frac{4}{5} \times 3.142 \times 15.6}{0.0136 \times 5\frac{4}{9}}$ correct to 3 significant figures.

Answer: _____[1]

3. Evaluate $14.697 - 7.842 \times \dfrac{2.52}{(1.8463)^2}$ correct to

(a) 1 significant figure.

Answer: _____[1]

(b) 3 significant figures

Answer: _____[1]

4. Divide 1.92168 by 62.8.

(a) Write the answer as shown in your calculator.

Answer: _____[1]

(b) Write the answer correct 2 correct significant figures.

Answer: _____[1]

5. Evaluate $\sqrt{\dfrac{2854.632 \times (29.432)^2}{(45.257)^3}}$

(a) correct to 2 decimal places;

Answer: _____[1]

(b) correct to 4 significant figures;

Answer: _____[1]

(c) correct to the nearest whole number.

Answer: _____[1]

SECTION B: CONCEPTS [30 MARKS]

NAME:	
CLASS:	
ANSWERS	
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	
10.	

I. MULTIPLE CHOICE

Write the **CAPITAL LETTER** of the correct answer in the table provided on the right.

1. Which one of the following is an integer?

   (A) 8.23 (B) $\frac{22}{7}$ (C) $\sqrt{2}$ (D) $\sqrt{4}$

2. Subtract 20 from the product of 4 and 15.

   (A) -40 (B) 1 (C) 40 (D) 9

3. The smallest of the fractions $\frac{5}{12}, \frac{3}{4}, \frac{5}{10}, \frac{9}{36}$ is:

   (A) $\frac{5}{12}$ (B) $\frac{3}{4}$ (C) $\frac{5}{10}$ (D) $\frac{9}{36}$

4. The cube root of $2^3 \times 3^6$ is:

   (A) 6 (B) 18 (C) 12 (D) 24

5. The repeating decimal 0.444… is equal to:

   (A) $\frac{5}{11}$ (B) $\frac{2}{50}$ (C) $\frac{5}{9}$ (D) $\frac{4}{9}$

6. How many odd numbers are there between 60 and 73?

   (A) 5 (B) 6 (C) 7 (D) 9

7. How many significant figures does the number 4.0010 have?

   (A) 5 (B) 6 (C) 2 (D) 4

8. The reciprocal of $3\frac{4}{5}$ is

   (A) $3\frac{5}{4}$ (B) $5\frac{3}{4}$ (C) $\frac{19}{5}$ (D) $\frac{5}{19}$

9. Which of the following is NOT a prime number?

   (A) 31 (B) 41 (C) 51 (D) 61

10. The following are divisible by 3, EXCEPT:

    (A) 123 (C) 12 345

    (B) 1 234 (D) 123 456

PART II – SHORT-ANSWER QUESTIONS

11. Use >, < or = in filling in the box in each number. [2]

(a) $\frac{2}{9}$ ☐ 0.22 (b) $\sqrt{125}$ ☐ $\sqrt[3]{225}$

12. Arrange $0.\overline{45}$, $0.4\overline{5}$, $4.\overline{5}$, $0.\overline{454}$ in descending order.

Answer: _____[2]

13. Write the number 1045.2781 correct to:

(a) 2 decimal places

Answer: _____[1]

(b) 2 significant figures

Answer: _____[1]

(c) 3 significant figures

Answer: _____[1]

(d) 1 significant figure

Answer: _____[1]

14. Mary is thinking of an integer between 60 and 90.
Write down the number she is thinking when it is:

(a) an odd square number;

Answer: _____[1]

(b) a multiple of 29;

Answer: _____[1]

(c) a cube number;

Answer: _____[1]

(d) a pair of twin primes;

Answer: _____[1]

(e) the largest number divisible by 8 and 3.

Answer: _____[1]

15. Shade ¼ of the figure on the right. [2]

16. (a) The altitude of Death Valley is -86 metres.
The altitude of Mount Whitney is 4418 metres.
What is the difference between these two altitudes?

Answer: _____[1]

(b) Maria recorded the outside temperature every three hours.

At 07 00 the temperature was -2℃.

(i) This was 5℃ higher than the temperature at 04 00.

Write down the temperature at 04 00.

Answer: _____[1]

(ii) At 10 00 the temperature was 11℃.

Write down the amount of change in temperature between 04 00 and 10 00.

Answer: _____[1]

17. Change 4.454545… into a fraction.

Answer: _____[2]

SECTION C: CALCULATION (40 Marks)
SHOW COMPLETE WORKING. MARKS MAY BE DEDUCTED IF NECESSARY WORKING IS NOT SHOWN.

1. (a) (i) Write all the factors of 80.

Write all the factors of 56.

Answer:

Factors of 80: _____[1]

Factors of 56: _____[1]

(ii) Write all the Highest Common Factor of 80 and 56.

Answer: _____[1]

(b) Using Continuous Division, find the Least Common Multiple (LCM) of 150 and 240.

Answer: _____[2]

(c) Write 150 and 240 as the product of their prime factors.

150 = _____

240 = _____

Hence, use their prime factorisation to find the HCF of 150 and 240.

Answer: _____[3]

(d) Write the LCM and HCF of the following, **leave your answers in index form.**

$2^3 \times 3^4 \times 5 \times 7^2 \times 11$

$3^3 \times 5 \times 7 \times 11^2$

$2^2 \times 3 \times 5^2 \times 7^3 \times 11$.

Answer:

HCF: _____[1]

LCM: _____[1]

2. (a) (i) Write the prime factorization of 2160.

Answer: _____[3]

(ii) Using your prime factorisation in (i) above, what is the smallest number that can be multiplied to 2160 to make the result a square number.

Answer: _____[1]

(iii) Using your prime factorisation in (i), what is the smallest number that can divide 2160 to make the result a cube number.

Answer: _____[1]

(b) If $3136 = 2^6 \times 7^2$ and $729\,000 = 2^3 \times 3^6 \times 5^3$, solve $\sqrt{3136} + \sqrt[3]{729000}$.

Answer: _____[3]

3. Complete the table of squares and cubes below. The first one is done for you. [3]

Number	Square	Cube
3	9	27
	121	
7		
		2744

4. Solve each of the following using the correct order of operations.

(a) $(2^3 - \sqrt[3]{125}) \div 3$ [2]

(b) $7\frac{4}{5} + 3\frac{1}{2} - 9\frac{2}{3}$ [2]

(c) $\frac{45}{56} \times \frac{8}{27} \div \frac{10}{14}$ [2]

(d) $7 - 4.65 \times 1.5$ [2]

(e) $3 \div (5\frac{2}{5} \times 1\frac{1}{9}) + \frac{5}{10}$ [2]

(a) (

(f) $\frac{7.2}{0.2} \times \frac{0.48}{1.8} \times \frac{0.025}{0.004}$ [2]

(g) $24 \times \{ 47 - 4 \times [3^2 + (45 - 20) \div 5] + 15 \}$ [3]

(h) $\sqrt{16^2 + 8^2 + 4^2 + 5^2} + \sqrt[3]{(9^3 - 13^2) + \sqrt{16} - \sqrt{225} - (6^2 + 1^2)}$ [4]

SECTION D: WORD PROBLEMS

1. (a) The length of a metallic rod is 15 cm correct to the nearest cm.

Write the upper and lower boundaries of the said rod.

Answer: _____ $\leq$ rod (cm) < _____[1]

(b) The sides of a rectangle measure 5 meters by 6 meters, correct to the nearest meter.

(i) Write the upper and lower boundaries of the perimeter *P* of the rectangle.

Answer: _____ $\leq$ *P* (m) < _____[1]

(ii) Write the upper and lower boundaries of the area *A* of the said rectangle.

Answer:

Upper Boundary: _____[1]

Lower Boundary: _____[1]

2. During the holiday, Hannah rents a bike.

   The fixed rental fee of the bike is $8 and an additional $4.50 per day.

   Hannah pays with $50 note and receives $10.50 change.

   Calculate for how many days Hannah rents the bike.

Answer: _____[4]

3. Karen earns $9000 each month.

   She is deducted $\frac{7}{50}$ of this salary **for tax and insurance**.

   She pays $\frac{2}{9}$ of the **remaining salary for rent.**

   She spends $1200 **for food and transportation** and saves the rest.

   Calculate the amount she saves.

Answer: _____[4]

4. Find the smallest number which when divided by 2, 3, 4, 5, 6, 7, 9 or 10 will give a remainder of 1 every time.

Answer: _____[4]

5. A rectangular piece of paper measuring 104 cm long and 78 cm wide is to be cut in squares of equal dimensions in the largest possible way. If nothing is to be wasted,

   (a) find the area of the largest possible square

Answer: _____[3]

   (b) find the total the number of squares

Answer: _____[1]

- E N D O F E X A M -