Half-Yearly Examination 2023/2024

S.1 Mathematics (Paper II) Time: 45 minutes

INSTRUCTIONS

1. Read carefully the instructions on the Answer Sheet and insert the information required in the spaces provided.

2. When told to open this book, you should check that all the questions are there. Look for the words '**END OF PAPER**' after the last question.

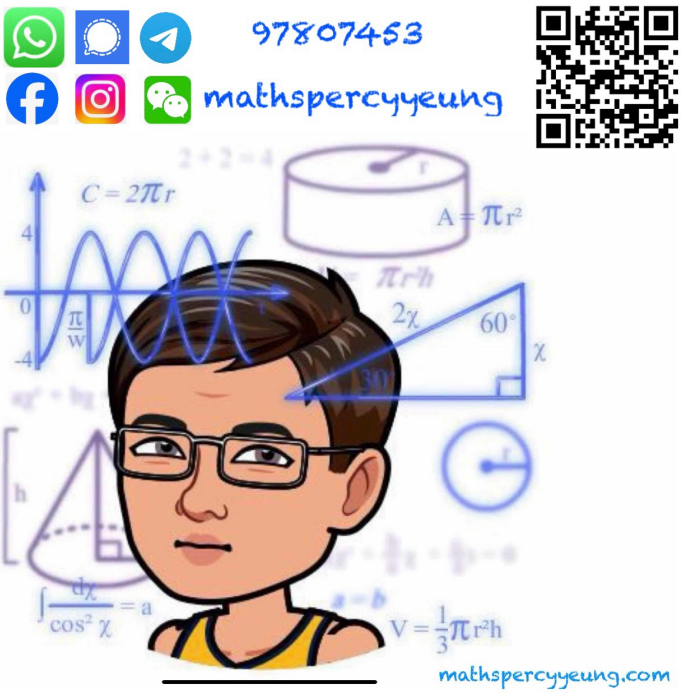
3. All questions carry equal marks.

4. **ANSWER ALL QUESTIONS.** You are advised to use an HB pencil to mark all the answers on the Answer Sheet, so that wrong marks can be completely erased with a clean rubber. You must mark the answers clearly; otherwise you will lose marks if the answers cannot be captured.

5. You should mark only **ONE** answer for each question. If you mark more than one answer, you will receive **NO MARKS** for that question.

6. No marks will be deducted for wrong answers.

7. You are **NOT ALLOWED** to use calculators.



There are 24 questions in this paper.
The diagrams in this paper are not necessarily drawn to scale.
Choose the best answer for each question.

1. Which of the following are prime factors of 36?
   I. 1 II. 2 III. 3 IV. 4
   A. I and II only
   B. II and III only
   C. III and IV only
   D. I, II, III and IV

2. Which of the following expressions has a result different from the others?
   A. $18 \div 6 + 3 \times 5$
   B. $18 \div 6 + (3 \times 5)$
   C. $(18 \div 6) + (3 \times 5)$
   D. $18 \div (6 + 3) \times 5$

3. If $a > b > 0 > c$, which of the following expression must be positive?
   A. $ab + c$
   B. $a + b + c$
   C. $a - b - c$
   D. abc

4. Express "Multiply 20 by the sum of 3 times of x and 2" by an algebraic expression.
   A. $20(3x + 2)$
   B. $20(3)(x + 2)$
   C. $20(3x) + 2$
   D. $20 + (3x + 2)$

5. Let a_n be the general term of the sequence '……14, 21, 30, 41……'.
   Which of the following is a possible expression of a_n?
   A. $7n$
   B. $n^2 + 5$
   C. $3n + 2$
   D. $2n^2 - 1$

6. Expand $(3x + 1)(2x^2 - x - 1)$. What is the coefficient of x^2?
   A. -4
   B. -1
   C. 2
   D. 6

7. It is given that the formula $d = \frac{v^2 - u^2}{2a}$. Find the value of d if $v = 4$, $u = -8$ and $a = -2$.
   A. -20
   B. -8
   C. 4
   D. 12

8. The price of a mouse is \$30 more than one-third of that of a keyboard. If the price of the keyboard is \$$x$, express the total price of a mouse and a keyboard in terms of x.
   A. $\$(4x + 30)$
   B. $\$\left(\frac{x}{3} + 30\right)$
   C. $\$\left(\frac{2x}{3} + 30\right)$
   D. $\$\left(\frac{4x}{3} + 30\right)$

9. Peter, Paul and Mary are running on the playground. Peter completes a lap in 20 seconds, Paul completes a lap in 24 seconds and Mary completes a lap in 30 seconds. They start running at the same time at the same place and in the same direction. Their speeds remain unchanged throughout the whole journey. If they meet at the starting point again x minutes later, what is the smallest possible value of x?
   A. 2
   B. 4
   C. 10
   D. 120

10. The general term of a sequence is $6n + 5$. Which of the following is a term of the sequence?
   A. 1
   B. 13
   C. 47
   D. 61

11. Which of the following statements is/are correct?
   I. The number of significant figures in 0.00360 is 3.
   II. The number of significant figures in 28000 is possible to be 4.
   A. I only
   B. II only
   C. I and II
   D. None of the above

12. It is given that $A = 2^3 \times 3^3$, $B = 2^2 \times 3^2 \times 7$ and $C = 2 \times 3^3 \times 7 \times 11$. Find the H.C.F. of A, B and C.
   A. 2×3^2
   B. $2^3 \times 3^3$
   C. $2 \times 3 \times 7 \times 11$
   D. $2^3 \times 3^3 \times 7 \times 11$

13. If the last two digits of an integer of Q are "00", then Q must be divisible by which of the following integers?

I. 4

II. 5

III. 8

A. I and II only
B. I and III only
C. II and III only
D. I, II and III

14. Simplify $x^2(x + 2x)$.

A. $2x^4$
B. $3x^3$
C. $3x^4$
D. $4x^3$

15. $(-2)^{888} \times \left(\frac{1}{2}\right)^{890} =$

A. $\frac{1}{4}$
B. $\frac{1}{2}$
C. 2
D. $\frac{-1}{4}$

16. $x - x - x - x - x - x \times x \times x \times x$

A. $-4x - 3x^3$
B. $-3x - 4x^4$
C. $-5x - x^3$
D. $-3x - x^4$

17. Solve $\frac{x-3}{5} + 2 = 10$.

A. 37
B. 43
C. -49
D. -51

18. Solve $(7 - 3x) - 3(x + 5) = 0$.

A. $\frac{11}{3}$
B. 2
C. 0
D. $-\frac{4}{3}$

19. It is given that $1.647 < x < 1.653$. Which of the following must be true?
    A. $x = 1.7$, correct to 1 d.p.
    B. $x = 1.6$, correct to 2 sig. fig
    C. $x = 1.65$, correct to 3 sig. fig
    D. $x = 1.650$, correct to 4 sig. fig

20. Peter is now *x* years old and his sister is 4 years older than him. If Peter's age is 10 years less than 2 times the age of his sister, find the age of Peter's sister.
    A. 2 years old
    B. 4 years old
    C. 6 years old
    D. 10 years old

21. $(2x - y)^2 =$
    A. $4x^2 + y^2$
    B. $4x^2 - y^2$
    C. $4x^2 - 4xy + y^2$
    D. $4x^2 - 4xy - y^2$

22. Ms. Chan has two types of coins, $2 coins and $5 coins. The number of $2 coins is 4 less than three times that of $5 coins. If Ms. Chan has 40 coins in total, find the total value of the coins.
    A. $55
    B. $58
    C. $110
    D. $113

23. If $a = b$, which of the following must be correct?
    I. $a \times 10 = 10 \times b$
    II. $\frac{a}{-5} = \frac{-b}{5}$
    III. $\frac{a+b}{2} = -\frac{1}{2}(-a - b)$
    A. I and II only
    B. I and III only
    C. II and III only
    D. I, II and III

24. $\frac{8^{n+1}}{2^n} =$
    A. 4
    B. 2^{2n+3}
    C. 2^{2n+1}
    D. 4^n

END OF PAPER