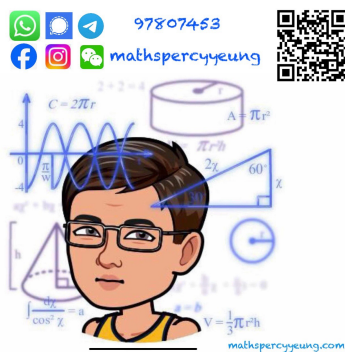


19-20 F.4
1st TERM EXAM
MATH CP
PAPER 2



2019 - 2020

F.4 First Term Examination

MATHEMATICS Compulsory Part PAPER 2

6th January, 2020

9:30 am – 10:15 am

Time Allowed : 45 minutes

INSTRUCTIONS

1. Read carefully the instructions on the Answer Sheet. 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 should use an HB pencil to mark all your 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.

The diagrams in this paper are not necessarily drawn to scale.

Choose the best answer for each question.

Section A

1. $(5 \cdot 25^{n+1})^3 =$

- A. 5^{6n+6} .
- B. 5^{6n+9} .
- C. 5^{9n+3} .
- D. 5^{9n+6} .

2. If $\frac{p+2q}{pq} = 1$, then $q =$

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

3. Let m and n be constants. If $m(x+4)^2 + n(x-1)^2 \equiv x^2 + 28x + 46$, then $m =$

- A. 1.
- B. 3.
- C. -2.
- D. -4.

4. $(3x+y)^2 - (3x-y)^2 =$

- A. 0.
- B. $2y^2$.
- C. $6xy$.
- D. $12xy$.

5. Which of the following numbers must be rational?

- I. $3\pi - \sqrt{2}$
- II. $3.\dot{1}4\dot{1}$
- III. $\sqrt{5} + 3\sqrt{5} - \sqrt{80}$

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

6. Solve $2x^2 - 5x - 6 = 0$.

- A. $-\frac{5}{4} \pm \frac{\sqrt{37}}{4}$
- B. $\frac{5}{4} \pm \frac{\sqrt{37}}{4}$
- C. $-\frac{5}{4} \pm \frac{\sqrt{73}}{4}$
- D. $\frac{5}{4} \pm \frac{\sqrt{73}}{4}$

7. Let k be a constant. Solve the equation $2x = x(x-k)$.

- A. $x = 0$ only
- B. $x = k$ only
- C. $x = 0$ or $x = 2 + k$
- D. $x = 0$ or $x = k$

8. Let a be a constant. Find the range of values of a such that the quadratic equation $5x^2 + 10x + a = 6$ has no real roots.

- A. $a < 11$
- B. $a > 11$
- C. $a < 5$
- D. $a > 5$

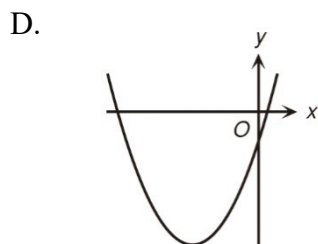
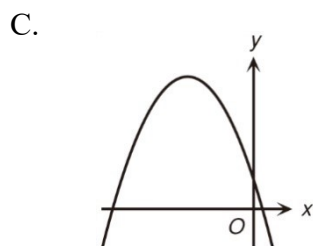
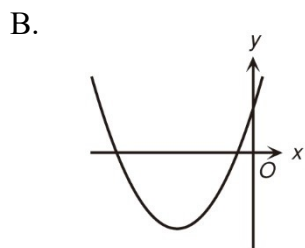
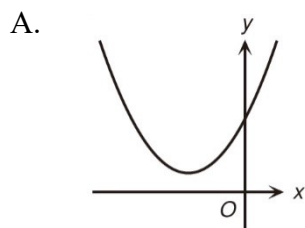
9. If $f(x) = x^2 + 2x - 13$, then $2f(3) - 1 =$

- A. 3.
- B. 5.
- C. 15.
- D. 28.

10. If $f(x) = 3x^2 - 4x - 1$, then $f(2m + 1) =$

- A. $6m^2 - 2m - 2$.
- B. $6m^2 - 2m + 6$.
- C. $12m^2 + 4m - 2$.
- D. $12m^2 - 8m - 2$.

11. Which of the following may represent the graph of $y = 2x^2 + 7x + 3$?



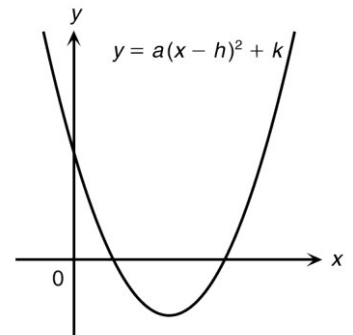
12. Which of the following is a function of x ?

- I. $y = \frac{1}{\sqrt{x^2 + 3}}$
- II. $y = x^3 - \frac{1}{x}$, where $x \neq 0$
- III. $y^2 = 1 - x$, where $x \leq 1$

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

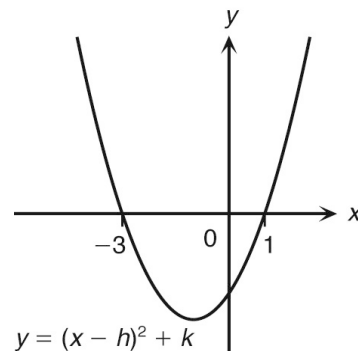
13. The figure shows the graph of $y = a(x - h)^2 + k$. Which of the following are true?

- I. $a > 0$
- II. $h > 0$
- III. $k < 0$



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

14. The figure shows the graph of $y = (x - h)^2 + k$ with two x -intercepts -3 and 1 . Find the values of h and k .



- A. $h = -1, k = -2$
- B. $h = -1, k = -4$
- C. $h = -2, k = -3$
- D. $h = -2, k = -5$

15. Find the quotient when $-6x^3 + 5x^2 - 10x + 1$ is divided by $1 - 3x$.

- A. $-2x^2 + x + 3$
- B. $-2x^2 - x + 3$
- C. $2x^2 + x - 3$
- D. $2x^2 - x + 3$

16. Let $f(x)$ be a polynomial. If $f(x)$ is divisible by $x - 2$, which of the following must be a factor of $f(x - 2)$?

- A. $x + 2$
- B. x
- C. $x - 2$
- D. $x - 4$

17. Let $f(x) = x^3 - 3x + k$, where k is a constant. If $f(x)$ is divisible by $x - 3$, find the remainder when $f(x)$ is divided by $x + 3$.

- A. -36
- B. -18
- C. 0
- D. 18

18. The domain of the function

$$f(x) = \frac{1}{\sqrt{x-1} - \sqrt{x}}$$
 is

- A. All real numbers.
- B. All real numbers except 0.
- C. All real numbers greater than or equal to 0.
- D. All real numbers greater than or equal to 1.

19. Find the equation of straight line L with x -intercept p and slope q .

- A. $px - y - pq = 0$
- B. $px + y + q = 0$
- C. $qx - y - pq = 0$
- D. $qx - y + p = 0$

Section B

20. If the sum of the roots of $4x^2 - 2x + k(2x - 1) = 0$ is 4, find the value of k .

- A. -1
- B. -4
- C. -7
- D. -10

21. The H.C.F. of $6x^3y^2z^5$, $8x^2y^8z^3$ and $12xy^3$ is

- A. $2xy^2$.
- B. $2xy^2z^3$.
- C. $24x^3y^8z^5$.
- D. $24xy^2z^3$.

22. The L.C.M. of $2x^2 - x - 1$ and $4x^2 - 1$ is

- A. $(x + 1)(2x + 1)(2x - 1)$.
- B. $(x - 1)(2x + 1)(2x - 1)$.
- C. $(x + 1)(2x + 1)^2(2x - 1)$.
- D. $(x - 1)(2x + 1)^2(2x - 1)$.

23. $\frac{2x}{x^2-3x+2} - \frac{x-3}{x^2-4x+3} =$

A. $\frac{x+2}{(x-1)(x-2)}$.

B. $\frac{x+3}{(x-1)(x-2)}$.

C. $\frac{x+2}{(x-1)(x-3)}$.

D. $\frac{x+3}{(x-1)(x+2)}$.

24. Form a quadratic equation in x whose roots are $2+\sqrt{5}$ and $2-\sqrt{5}$.

A. $x^2-4x-1=0$

B. $x^2+4x-1=0$

C. $x^2-4x+1=0$

D. $x^2+4x+1=0$

25. Find the minimum value of the function $y = x^2 + 12x$.

A. -4

B. -16

C. -36

D. -64

26. Let $f(x) = 2x^2 + 4x + k$, where k is a constant. If the y -coordinate of the vertex of the graph of $y = f(x)$ is -9 , then $k =$

A. -11 .

B. -7 .

C. -5 .

D. 8 .

27. If $\frac{9x+2}{(x-7)(x+6)} \equiv \frac{A}{x-7} + \frac{B}{x+6}$, then

A. $A = -5, B = -4$.

B. $A = -5, B = 4$.

C. $A = 5, B = -4$.

D. $A = 5, B = 4$.

END OF PAPER

