ANANDALAYA
PERIODIC TEST – 1
Class: X

Subject: Mathematics (041) &(241)　　　　　　　　　　　　　　　　　　　M.M:40
Date :14/07/2023　　　　　　　　　　　　　　　　　　　Time: 1hour 30 Minutes

General Instructions:
1. The question paper consists of 22 questions divided into 3 sections A, B and C.
2. All questions are compulsory.
3. Section A comprises of 10 questions of 1 mark each.
4. Section B comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
5. Section C comprises of 6 questions of 3 marks each. Internal choice has been provided in two questions.
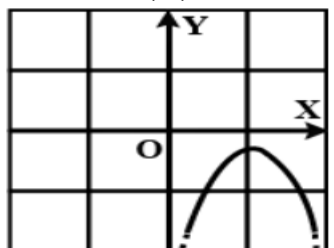
SECTION – A

1. Identify the ratio of the LCM and HCF of 5, 15 and 20? (1)
   (A)　　9 : 1　　　　(B)　　4:3　　　　(C)　　11: 1　　　　(D)　　12 : 1

2. If $x = a$ and $y = b$ is the solutions of the pair of equations $x - y = 2$ and $x + y = 4,$ then the respective values of a and b are _____. (1)
   (A)　　3, 5　　　　(B)　　5, 3　　　　(C)　　3, 1　　　　(D)　　$-1, -3$

3. Which of the following is not the graph of a quadratic polynomial? (1)
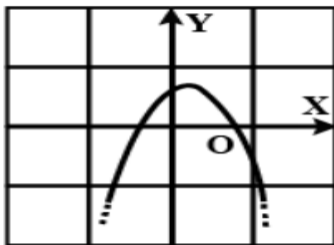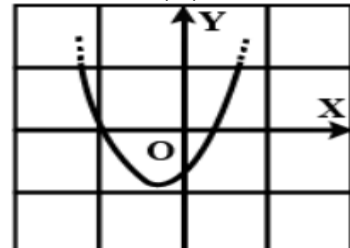

(A)
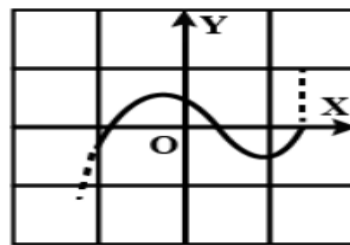
(B)

(C)

(D)

4. If the difference of the roots of the equation $x^2 - bx + c = 0$ be 1, then _____. (1)
   (A)　　$b^2 - 4c + 1 = 0$　　　　　　(B)　　$b^2 + 4c = 0$
   (C)　　$b^2 - 4c - 1 = 0$　　　　　　(D)　　$b^2 - 4c = 0$

5. Find c if the system of equations $cx + 3y + (3 - c) = 0; 12x + cy - c = 0$ has infinitely many solutions. (1)
   (A)　　2　　　　(B)　　3　　　　(C)　　4　　　　(D)　　6

6. The quadratic equation whose roots are twice the roots of $2x^2 - 5x + 2 = 0$ is _____. (1)
   (A) $8x^2 - 10x + 2 = 0$　　　　　　(B) $x^2 - 4x + 4 = 0$
   (C) $x^2 - 5x + 4 = 0$　　　　　　(D) $2x^2 - 5x + 2 = 0$

7. The exponent of 3 in the prime factorization of 162 is _____. (1)
   (A) 2   (B) 3   (C) 4   (D) 0

8. Which of the following is a solution of the equation $x^2 - 6x + 5 = 0$. (1)
   (A) 2   (B) 5   (C) 9   (D) 3

9. If one zero of polynomial $p(x) = ax^2 + bx + c$ is zero, then value of c = _____. (1)
   (A) a   (B) b   (C) any real value   (D) 0

10. The pair of equations $y = 0$ and $y = 3$ has _____. (1)
    (A) one solution   (B) two solution
    (C) infinitely many solutions   (D) No solution

SECTION B

11. (a) Prove that $\sqrt{2}$ is an irrational number. (2)

<div align="center">OR</div>

   (b) Find the largest number which divides 615 and 963 leaving remainder 6 in each case.

12. A fraction becomes 1/3 when 1 is subtracted from the numerator and it becomes ¼ when 8 (2) is added to its denominator. Consider numerator is x and denominator y, and frame the linear equation for the given number.

13. (a) Find the value of k for which the roots of the quadratic equation $(k - 4)x^2 +$ (2) $2(k - 2)x + 2 = 0$ are equal.

<div align="center">OR</div>

   (b) If α, β are roots of $x^2 + 5x + a = 0$ and $2α + 5β = -1$, then find the value of a.

14. There are 576 boys and 448 girls in a school that are to be divided into equal section of (2) either boys or girls alone. Find the total number of sections thus formed.

15. Shrina is trying to draw the graph using Desmos, the open source for drawing graphs for any polynomial. She got the adjacent graph, help her for writing the real zeros of the given graph of polynomial. (2)
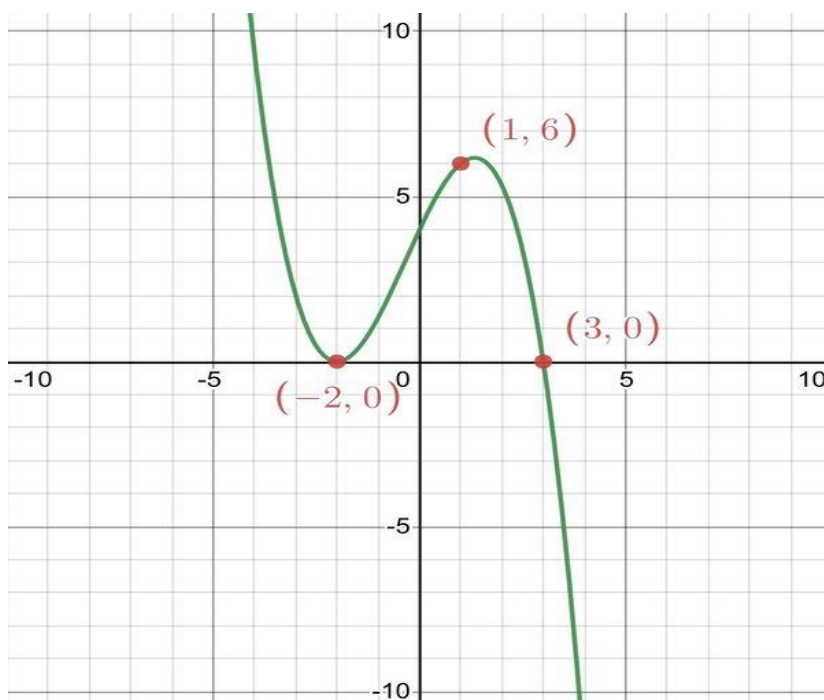
16. A number consists of two digits. Where the number is divided by the sum of its digits, the (2) quotient is 7. If 27 is subtracted from the number, the digits interchange their places, find the number.

<center>SECTION C</center>

17. A two-digit number is 4 times the sum of its digits and twice the product of its digits. Find (3) the number.

18. If one of the zero of the polynomial $q(x) = 2x^2 + x + p$ is 3, find the value of p, also find (3) the other zero.

19. A person on tour has ₹ 4200 for his expenses. If he extends his tour for 3 days he has to cut (3) down his daily expenses by ₹ 70. Find the duration of the tour.

20. (a) If α and β are the zeros of the quadratic polynomial $4x^2 + 4x + 1$, then form a (3) quadratic polynomial whose zeros are 2α and 2β.

<center>OR</center>

(b) Find the zeroes of the polynomial $x^2 - 5$ and verify the relationship between the zeroes and the coefficients.

21. (a) If the side of equilateral triangle is $(2x - y)$ cm and the side of square is $(x + 2y)$ cm, (3) if their perimeters are equal and it is 12cm, find the value of 5x – 5y.
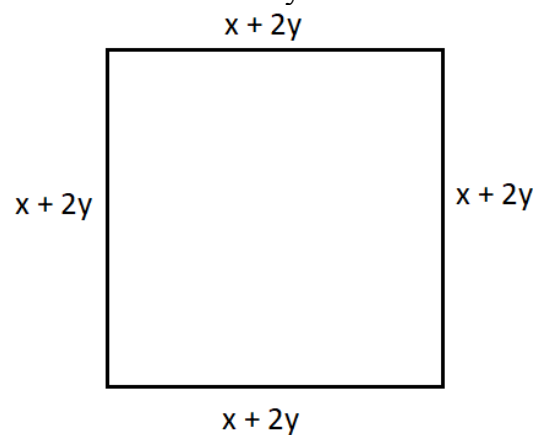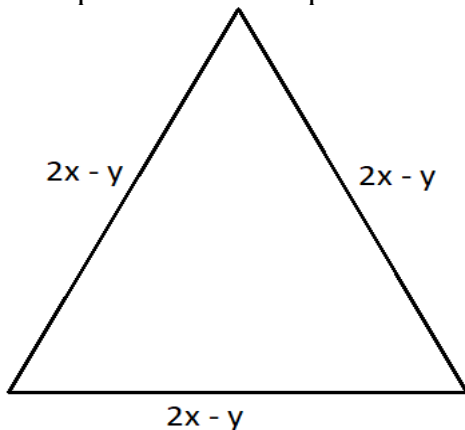
<center>OR</center>

(b) Find the graphical solution of $x + y = 5\ and\ x - y = 5$. Also shade the traingular region formed by the ines and the y axis.

22. The greatest number that will divide 76, 112, 172 and 184 so as to leave remainder 40 in (3) each case is $k^2 \times 3$. Find the value of k.