Mathematics
Class- X, Session: 2022-23
PERIODIC TEST-I

Date- 27-05-2022

Time Allowed: 1.5 hours **Maximum Marks: 40**

General Instructions:

1. **The question paper consists of 14 questions divided into 4 sections A, B, C, D.**
2. **All questions are compulsory.**
3. **Section A comprises of 5 questions of 1 mark each.**
4. **Section B comprises of 3 questions of 3 marks each.**
5. **Section C comprises of 4 questions of 4 marks each.**
6. **Section D comprises of two case study-based questions of 5 marks each.**

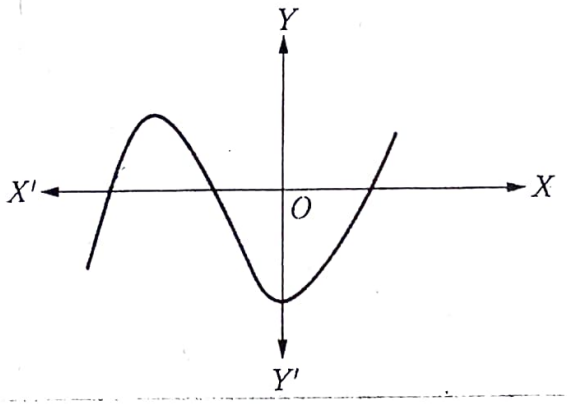
Section A

Q.1. What is the HCF of smallest prime number and the smallest composite number?

Q.2. If p is a prime number and it divides a^2 then it also divides ....., where a is a positive integer.

Q.3. Calculate the HCF of $3^3 \times 5^3$ and $3^5 \times 2^2$.

Q.4. The graph of a polynomial is shown in Figure, then how many zeroes it has?



Q.5. Two lines are given to be parallel. The equation of one of the lines is 5x + 7y = 14, then find the equation of the second line.

Section-B

Q.6. Find the value(s) of k so that the pair of equations 5x + 2y = 10 and 15x + ky = 7 has a unique solution.

Q.7. If p and q are the zeroes of polynomial $2x^2 + 5x - 5$. Find the value of $p^2 + q^2$.

Q.8. Find the H.C.F and L.C.M of 510 and 92 and verify that H.C.F × L.C.M = Product of two given numbers.

Section-C

Q.9. Find the zeroes of the quadratic polynomial $5x^2 + 8x - 4$ and verify the relationship between the zeroes and the coefficients of the polynomial.

Q.10. Solve the following pair of linear equations by the substitution method:

$2x + y = 7$

$4x - 3y + 1 = 0$

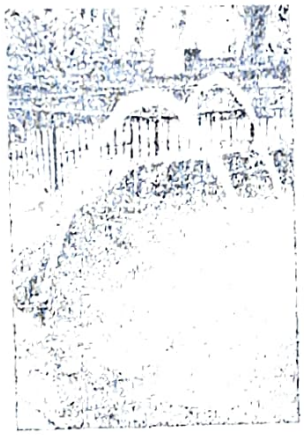
Q.11. Prove that $\sqrt{3}$ is irrational.

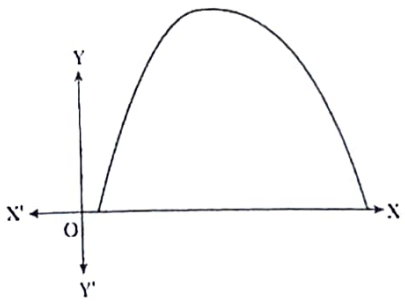
Q.12. Seven times a two-digit number is equal to four times the number obtained by reversing the order of its digits. If the difference of the digits is 3, determine the number.

Section-D

CASE STUDY-1

Q.13. Water flowing in a fountain follows trajectory as shown below:





(i) The shape formed by the water trajectory is

(a) ellipse (b) oval (c) parabola (d) spiral

(ii) Number of zeroes of polynomial is equal to the number of points where the graph of polynomial

(a) intersects x- axis (b) intersects y- axis

(c) intersects y- axis or x- axis (d) none of the above

(iii) If the trajectory is represented by $x^2 - 3x - 18$, then its zeros are

(a) $(6, -3)$ (b) $(-6, 3)$ (c) $(3, -3)$ (d) $(-6, -3)$

(iv) If -1 is one of the zeroes of $9x^2 - kx - 5$, then the value of k is

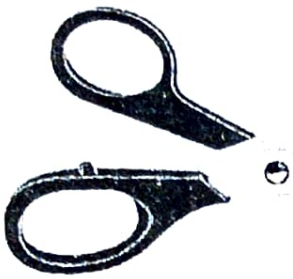
(a) 9 (b) 3 (c) 12 (d) -4

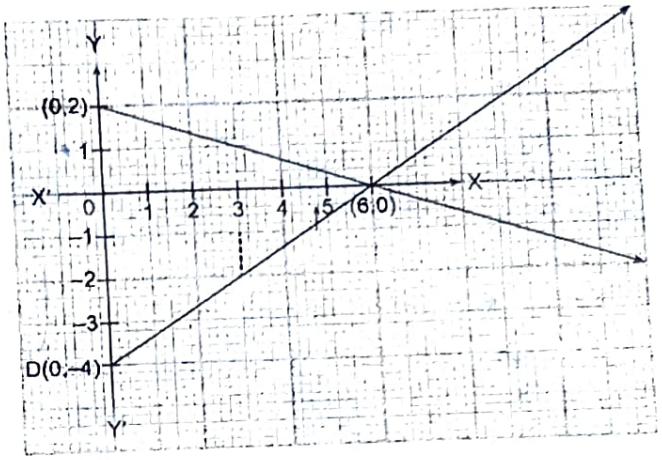
(v) If α, β and are the roots of the equation $x^2 - 3x + 5$ then $\alpha + \beta$ is equal to

(a) -3 (b) 3 (c) 5 (d) -5

CASE STUDY-2

Q.14. The scissors which is so common in our daily life use, its blades represent the graph of linear equations.





Let the blades of a scissor are represented by the system of linear equations:

$x + 3y = 6$ and $2x - 3y = 12$

(i) The pivot point (point of intersection) of the blades represented by the linear equation $x + 3y = 6$ and $2x - 3y = 12$ of the scissors is

(a) (2, 3) (b) (6, 0) (c) (3, 2) (d) (2, 6)

(ii) The points at which linear equations $x + 3y = 6$ and $2x - 3y = 12$ intersect y – axis respectively are:

(a) (0, 2) and (0, 6) (b) (0, 2) and (6, 0)

(c) (0, 2) and (0, -4) (d) (2, 0) and (0, -4)

(iii) The number of solutions of the system of linear equations $x + 2y - 8 = 0$ and $2x + 4y = 16$ is

(a) 0 (b) 1 (c) 2 (d) infinitely many

(iv) If (1, 2) is the solution of linear equations $ax + y = 3$ and $2x + by = 12$, then values of a and b are respectively

(a) 1, 5 (b) 2, 3 (c) -1, 5 (d) 3, 5

(v) If a pair of linear equations in two variables is consistent, then the lines represented by two equations are

(a) intersecting (b) parallel

(c) always coincident (d) intersecting or coincident