V.J.INTERNATIONAL SCHOOL

STD 10 Maths **Total Marks : 80**

Practice Test

Section A

*** Choose the right answer from the given options. [1 Marks Each]** **[18]**

1. Degree of polynomial $y^3 - 2y^2 - \sqrt{3}y + \frac{1}{2}$ is
   (A) $1/2$ (B) 2 (C) 3 (D) 4

2. If the sum of the zeroes of the polynomial $p(x) = \left(p^2 - 23\right)x^2 - 2x - 12$ is 1 , then p takes the value(s) are
   (A) $\sqrt{23}$ (B) -23 (C) 2 (D) ± 5

3. Which of the following is a pair of co-primes?
   (A) $(14, 35)$ (B) $(18, 25)$ (C) $(31, 93)$ (D) $(32, 62)$

4. The LCM of two numbers is 1200 . Which of the following cannot be their HCF?
   (A) 600 (B) 500 (C) 400 (D) 200

5. The LCM and HCF of two rational numbers are equal, then the numbers must be
   (A) prime (B) co-prime (C) composite (D) equal

6. The LCM of smallest odd prime number and the greatest two digit number is
   (A) 1 (B) 99 (C) 297 (D) 300

7. The HCF of two consecutive positive integers is
   (A) 0 (B) 1 (C) 4 (D) 2

8. If two positive integers p and q can be expressed as $p = 18a^2b^4$ and $q = 20a^3b^2$ where a and b are prime numbers, then $\mathrm{LCM}(p, q)$ is
   (A) $2a^2b^2$ (B) $180a^2b^2$ (C) $12a^2b^2$ (D) $180a^3b^4$

9. If one zero of the quadratic polynomial $kx^2 + 3x + k$ is 2 , then the value of k is
   (A) $\frac{5}{6}$ (B) $-\frac{5}{6}$ (C) $\frac{6}{5}$ (D) $-\frac{6}{5}$

10. If the product of two zeros of the polynomial $f(x) = 2x^3 + 6x^2 - 4x + 9$ is 3 , then its third zero is
    (A) $\frac{3}{2}$ (B) $-\frac{3}{2}$ (C) $\frac{9}{2}$ (D) $-\frac{9}{2}$

11. A quadratic polynomial, the sum of whose zeroes is 0 and one zero is 3 , is
    (A) $x^2 - 9$ (B) $x^2 + 9$ (C) $x^2 + 3$ (D) $x^2 - 3$

12. If α, β are the zeros of the polynomial $f(x) = ax^2 + bx + c$, then $\frac{1}{\alpha^2} + \frac{1}{\beta^2} =$
    (A) $\frac{b^2-2ac}{a^2}$ (B) $\frac{b^2-2ac}{c^2}$ (C) $\frac{b^2+2ac}{a^2}$ (D) $\frac{b^2+2ac}{c^2}$

13. If a polynomial $p(x)$ is given by $p(x) = x^2 - 5x + 6$, then the value of $p(1) + p(4)$ is
    (A) 0 (B) 4 (C) 2 (D) -4

14. Which of the following rational numbers is expressible as a terminating decimal?
    a. $\frac{124}{165}$
    b. $\frac{131}{30}$

c. $\frac{2027}{625}$
d. $\frac{1625}{462}$

15. A quadratic polynomial whose zeros are $\frac{3}{5}$ and $\frac{-1}{2}$ is:
   a. $10x^2 + x + 3$
   b. $10x^2 + x - 3$
   c. $10x^2 - x + 3$
   d. $10x^2 - x - 3$

16. What must be added to the polynomial $f(x) = x^4 + 2x^3 - 2x^2 + x - 1$ so that the resulting polynomial is exactly divisible by $x^2 + 2x - 3$?
   (A) $-x + 2$ (B) $x + 2$ (C) $x + 3$ (D) $x - 3$

17. A quadratic polynomial whose sum and product of zeroes are 2 and -1 respectively is :
   (A) $x^2 + 2x + 1$ (B) $x^2 - 2x - 1$
   (C) $x^2 + 2x - 1$ (D) $x^2 - 2x + 1$

18. If the zeroes of the polynomial $f(x) = x^3 - 12x^2 + 39x$ + K are in A.P., then the value of K is equal to
   (A) -28 (B) 28 (C) 29 (D) 27

*** A statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option.** **[2]**

19. Statement-1 (A): If product of two numbers is 5780 and theire HCF is 17, then teir LCM is 340.
   Statement-2 (R) : HCF is always a factor of LCM.
   (A) Statement-1 is true, Statement-2 is true; Statement-2 is a correct explanation for Statement-1.
   (B) Statement-1 is true, Statement-2 is true; Statement-2 is not a correct explanation for Statement-1.
   (C) Statement-1 is true, Statement-2 is false.
   (D) Statement- 1 is false, Statement-2 is true.

20. Statement-1 (A): If α, β and γ are the zeroes of the polynomial $6x^3 + 3x^2 - 5x + 1$, then $\alpha^{-1} + \beta^{-1} + \gamma^{-1} = 5$.
   Statement-2 (R): If α, β, γ are the zeroes of the cubic polynomial $ax^3 + bx^2 + cx + d$, then $\alpha + \beta + \gamma = -\frac{b}{a}$.
   (A) Statement-1 is true, Statement-2 is true; Statement-2 is a correct explanation for Statement-1.
   (B) Statement- 1 is true, Statement- 2 is true; Statement- 2 is not a correct explanation for Statement-1.
   (C) Statement-1 is true, Statement-2 is false.
   (D) Statement-1 is false, Statement-2 is true.

Section B

*** Given section consists of questions of 2 marks each.** **[10]**

1. Find the LCM and HCF of 26 and 91 pairs of integers and verify that LCM $\times$ HCF = product of the two numbers.

2. Find the LCM and HCF of the following pairs of integers and verify that LCM × HCF = Product of the integers:
   510 and 92
3. State Euclid's division lemma.
4. Find the zeros of the following quadratic polynomial and verify the relationship between the zeros and their coefficients:
   $h(t) = t^2 - 15$
5. Very-Short-Answer Questions:
   If the product of two numbers is 1050 and their HCF is 25, find their LCM.

Section C

*** Given section consists of questions of 3 marks each.** **[18]**

1. Prove that following numbers are irrationals:
   $5\sqrt{2}$
2. Prove that $4 - 5\sqrt{2}$ is an irrational number.
3. Prove that $2 - 3\sqrt{5}$ is an irrational number.
4. Find the zeros of the following quadratic polynomial and verify the relationship between the zeros and the coefficients:
   $2\sqrt{3}x^2 - 5x + \sqrt{3}$
5. Find the quadratic polynomial, the sum of whose roots is $\sqrt{2}$ and their product is $\frac{1}{3}$.
6. Find the zeros of the following quadratic polynomial and verify the relationship between the zeros and the coefficients:
   $x^2 - 5$

Section D

*** Given section consists of questions of 5 marks each.** **[20]**

1. Find all the zeros of the polynomial $2x^3 + x^2 - 6x - 3$, if two of its zeros are $-\sqrt{3}$ and $\sqrt{3}$.
2. Find the zeros of the following quadratic polynomial and verify the relationship between the zeros and their coefficients:
   $p(x) = \sqrt{3}x^2 + 10x + 7\sqrt{3}$
3. If the zeroes of the polynomial $x^3 - 3x^2 + x + 1$ are $(a - b)$, a and $(a + b)$, find the values of a and b.
4. If 2 and -2 are two zeros of the polynomial $(x^4 + x^3 - 34x^2 - 4x + 120)$, find all the zeros of given polynomial.

Section E

*** Case study based questions** **[12]**

1. Decimal form of rational numbers can be classified into two types.
   - Let x be a rational number whose decimal expansion terminates. Then x can be expressed in the form $\frac{p}{q}$, where p and q are co-prime and the prime factorisation of q

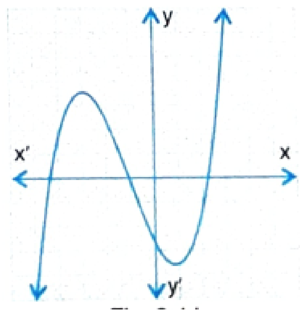
is of the form $2^{\mathrm{n}} \times 5^{\mathrm{m}}$, where n, rn are non-negative integers and vice-versa.

- Let $\mathrm{x} = \frac{\mathrm{p}}{\mathrm{q}}$ be a rational number, such that the prime factorisation of q is not of the form $2^{\mathrm{n}} \times 5^{\mathrm{m}}$, where n and m are non-negative integers. Then x has a non-terminating repeating decimal expansion.

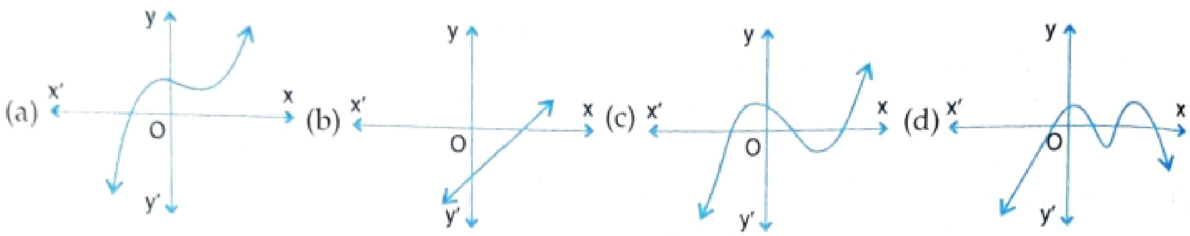
1. $\frac{441}{(2^2 \times 5^7 \times 7^2)}$ is which decimal?
2. $\frac{251}{(2^5 \times 5^3)}$ is which decimal?
3. does $\frac{15}{1600}$ have a terminating decimal expansion?
   Or
   $\frac{23}{(2^5 \times 5^3)} =$

2. Teaching Mathematics through activities is a powerful approach that enhances students' understanding and engagement. Keeping this in mind, Ms. Mukta planned a prime number game for class 5 students. She announces the number 2 in her class and asked the first student to multiply it by a prime number and then pass it to second student. Second student also multiplied it by a prime number and passed it to third student. In this way by multiplying to a prime number, the last student got 173250.
Now, Mukta asked some questions as given below to the students:
(i) What is the least prime number used by students?
(ii) (a) How many students are in the class?
OR
(b) What is the highest prime number used by students?
(iii) Which prime number has been used maximum times?

3. Polynomials are everywhere. They play a key role in the study of algebra, in analysis and on the whole many mathematical problems involving them. Since polynomials are used to describe curves of various types, engineers use polynomials to graph the curves of roller coasters.



Based on the given information answer the following questions:
(i) If the Roller Coaster is represented by the graph $y = p(x)$, shown in Fig then the type of the polynomial it traces, is
(a) linear (b) quadratic (c) cubic (d) biquadratic
(ii) The Roller Coasters are represented by the following graphs $y = p(x)$ shown in Fig Which Roller Coaster graph has more than three distinct zeroes?

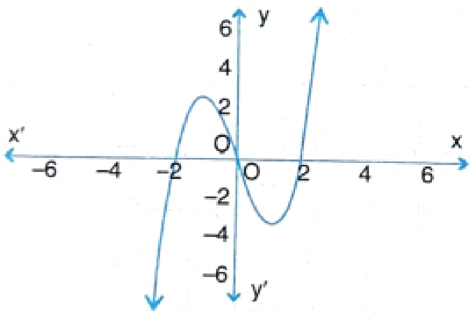


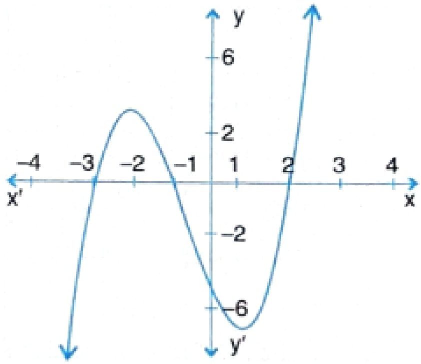
(iii) If the Roller Coaster is represented by the cubic polynomial $t(x) = px^3 + qx^2 + rx + s$, then which of the following is always true

(a) $s \neq 0$ (b) $r \neq 0$ (c) $q \neq 0$ (d) $p \neq 0$

(iv) If the path traced by the Roller Coaster is represented by the graph $y = p(x)$, shown in Fig., then the number of zeroes is

(a) 0 (b) 1 (c) 2 (d) 3





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