

MM:30

TIME: 1hr

General Instructions:

1. The question paper consist of 17 questions of 5 sections A, B, C, D and E. Each section is compulsory.
2. Section A has 10 MCQs and 02 Assertion -Reason based questions carrying 1 mark each
3. Section B has 01 Very Short Answer type question of 02 marks.
4. Section C has 01 Short Answer type question of 03 marks.
5. Section D has 01 Long Answer type question of 05 marks.
6. Section E has 2 case based integrated units of assessment (04 marks each) with sub-parts.

SECTION- A

1. If one zero of the polynomial $6x^2 + 4x - (k - 2)$ is reciprocal of the other, then the value of k is :

(a) 4 (b) -6 (c) 6 (d) -4

2. $6 \times 5 \times 4 \times 3 \times 2 \times 1 + 5$ is an example of:

(a) prime number (b) composite number
(c) irrational number (d) none of the above

3. The LCM of the two numbers is 9 times their HCF. The sum of LCM and HCF is 500. Then their HCF is

(a) 90 (b) 70 (c) 50 (d) 40

4. The graph of $y = p(x)$ is given, for a polynomial $p(x)$. The number of zeroes of $p(x)$ from the graph is



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

5. If two positive integers a and b are written as $a = p^3 q^2$ and $b = p q^3$, where p and q are prime numbers, then HCF (a, b) is:

(a) $p q^7$ (b) $p q$ (c) $p^1 q^1$ (d) $p^7 q^7$

6. If LCM $(x, 18) = 36$ and HCF $(x, 18) = 2$, then $x =$
 (a) 2 (b) 3 (c) 4 (d) 6
7. If α and β are the zeroes of the polynomial $f(x) = x^2 - x + 5$, then the value of $\frac{1}{\alpha^2} + \frac{1}{\beta^2}$ is:
 (a) $\frac{9}{25}$ (b) $(-\frac{9}{25})$ (c) $\frac{25}{9}$ (d) $(-\frac{25}{9})$
8. If 2 and $\frac{1}{2}$ are two zeroes of $px^2 + 5x + r$, then
 (a) $p = r = 2$ (b) $p = r = -2$ (c) $p = 2, r = -2$ (d) $p = -2, r = 2$
9. If $x + 2$ is factor of $x^2 + ax + 2b$ and $a + b = 4$, then
 (a) $a = 1, b = 3$ (b) $a = 3, b = 1$ (c) $a = -1, b = 5$ (d) $a = 5, b = -1$
10. The number of polynomials having zeroes -3 and 5 is
 (a) 1 (b) 2 (c) 3 (d) infinitely many
11. Assertion(A): $\sqrt{x}$ is an irrational number, where x is a prime number.
 Reason (R): Square root of every odd number is irrational.

- (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
 (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
 (c) Assertion (A) is true but reason (R) is false
 (d) Assertion (A) is false but reason (R) is true.

12. Assertion(A): The degree of a zero polynomial is not defined.
 Reason (R): The degree of a non-zero constant polynomial is 0.
 (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
 (b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
 (c) Assertion (A) is true but reason (R) is false
 (d) Assertion (A) is false but reason (R) is true

SECTION: B

13. Find the value of k such that the polynomial $x^2 - (k + 6)x + 2(2k - 1)$ has sum of its zeroes equals to half of their product. 2

SECTION: C

14. Show that $5 - \sqrt{3}$ is an irrational number, where $\sqrt{3}$ is given to be an irrational number. 3

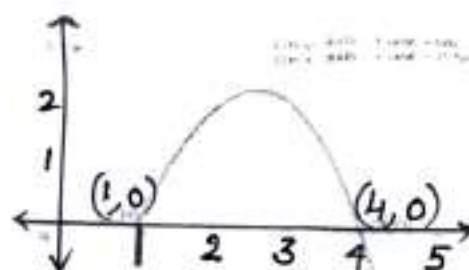
SECTION: D

15. Find the zeroes of the polynomial: $5\sqrt{5}x^2 + 30x + 8\sqrt{5}$. Verify the relation between zeroes and its coefficients. 5

SECTION - E

16 Case study 1:

Radha, an aspiring landscape designer, is tasked with creating a visually captivating pool design that incorporates a unique arrangement of fountains. The challenge entails arranging the fountains in such a way that when water is thrown upwards, it forms the shape of a parabola. The graph of one such a parabola is given below



Based on the above information, answer the following questions:

- (i) For polynomial $p(x) = ax^2 + bx + c$, the graph of $p(x)$ open upward, when 'a' will be....?
- (ii) Find the zeroes of the polynomial from the graph.
- (iii) What will be the expression of the polynomial?

OR

Write an example of a quadratic polynomial which cuts(touches) the x-axis only at one point.

1+
1+
2

17

Case study 2

To enhance the reading skills of grade VIII students, the school nominates two students to set up a class library. There are two sections, section A and section B of Grade VIII. There are 40 students in section A and 44 students in section B. Based on the above information, answer the following.



- (i) What is the minimum number of books you will acquire for the class library, so that they can be distributed equally among students of Section A or Section B
- (ii) What is the HCF of two coprime numbers A and B.
- (iii) Verify that the product of two positive integers is equal to the product of their HCF and LCM by taking the numbers 40 and 44.

OR

Can two numbers have 18 as their HCF and 380 as their LCM? Give reasons.

1+
1+
2

3 1/2