

Time : 1 Hour 30 Minute

STD 10 Maths

Total Marks : 50

Chapter Based Test

Section A

* Choose the right answer from the given options. [1 Marks Each] [7]

- If 2, -7 and -14 are the sum, sum of the product of its zeroes taken two at a time and the product of its zeroes of a cubic polynomial, then the cubic polynomial is:
 (A) $x^3 + 2x^2 + 7x + 14$ (B) $x^3 - 2x^2 - 7x + 14$ (C) $x^3 - 2x^2 + 7x + 14$ (D) $x^3 - 2x^2 - 7x - 14$
- A quadratic polynomial whose zeroes are -3 and 6, is:
 (A) $x^2 - 3x + 18$ (B) $x^2 + 3x + 18$ (C) $\frac{x^2}{6} - \frac{x}{2} - 3$ (D) $x^2 + 3x - 18$
- If two zeros of $x^3 + x^2 - 5x - 5$ are $5 - \sqrt{5}$ and $-5 - \sqrt{5}$ then its third zero is:
 (A) -1 (B) 2 (C) -2 (D) 1
- The number of polynomials having zeroes as -2 and 5 is:
 (A) 1 (B) 2 (C) 3 (D) more than 3
- If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and -3, then:
 (A) $a = 2, b = -6$ (B) $a = -7, b = -1$ (C) $a = 0, b = -6$ (D) $a = 5, b = -1$
- If zeros of the polynomial $f(x) = x^3 - 3px^2 + qx - r$ are in A.P., then:
 a. $2p^3 = pq - r$
 b. $2p^3 = pq + r$
 c. $p^3 = pq - r$
 d. None of these.
- If one of the zeroes of the quadratic polynomial $(k - 1)x^2 + kx + 1$ is -3, then the value of k is:
 a. $\frac{4}{3}$
 b. $\frac{-4}{3}$
 c. $\frac{2}{3}$
 d. $\frac{-2}{3}$

* A statement of Assertion (A) is followed by a statement of Reason (R). [3]

Choose the correct option.

- Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following:

Assertion: If a, b, c are the zeroes of $x^3 - 2x^2 + qx - r$ and $a + b = 0$ then $2q = r$.

Reason: If a, b, c are the zeroes of $px^3 + qx^2 + rx + s$ then $a + b + c = -\frac{q}{p}$,
 $ab + bc + ca = \frac{r}{s}$, $abc = -\frac{s}{p}$.

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

9. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following:

Assertion: $x^3 + x$ has only one real zero.

Reason: A polynomial of n^{th} degree must have n real Zeroes.

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

10. **Directions:** In the following questions, the Assertions (A) and Reason(s) (R) have been put forward. Read both the statements carefully and choose the correct alternative from the following:

Assertion: $x^2 + 4x + 5$ has two zeroes.

Reason: A quadratic polynomial can have at the most two zeroes.

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

* **State whether the following sentences are True or False. [1 Marks Each] [2]**

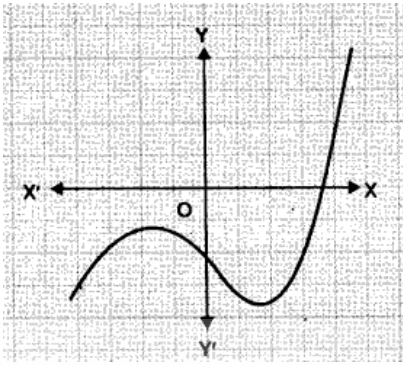
11. Are the following statements 'True' or 'False'? Justify your answers.

If all three zeroes of a cubic polynomial $x^3 + ax^2 - bx + c$ are positive, then at least one of a, b and c is non-negative.

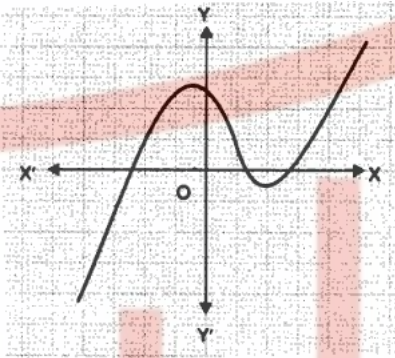
12. If a quadratic polynomial $f(x)$ is a square of a linear polynomial, then its two zeros are coincident. (True/ False).

* **Answer the following questions in one sentence. [1 Marks Each] [2]**

13. The graph of $y = p(x)$ in a figure given below, for some polynomial $p(x)$. Find the number of zeroes of $p(x)$.



14. The graph of $y = p(x)$ in a figure given below, for some polynomial $p(x)$. Find the number of zeroes of $p(x)$.

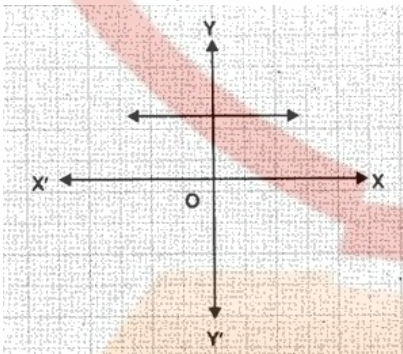


Section B

* Given section consists of questions of 2 marks each.

[10]

1. The graph of $y = p(x)$ in a figure given below, for some polynomial $p(x)$. Find the number of zeroes of $p(x)$.



2. Answer the following and justify:

Can the quadratic polynomial $x^2 + kx + k$ have equal zeroes for some odd integer $k > 1$?

3. The Sum and product of the zeros of a quadratic polynomial are $-\frac{1}{2}$ and -3 respectively. What is the quadratic polynomial?
4. Very-Short-Answer Question:
If the sum of the zeros of the quadratic polynomial $kx^2 - 3x + 5$ is 1, write the value of k .
5. Very-Short-Answer Question:
If 3 is a zero of the polynomial $2x^2 + x + k$, find the value of k .

Section C

* Given section consists of questions of 3 marks each.

[12]

1. If α and β are the zeroes of the quadratic polynomial $f(x) = x^2 - x - 2$, find the value of $\frac{1}{\alpha} - \frac{1}{\beta}$
2. If the squared difference of the zeroes of the quadratic polynomial $f(x) = x^2 + px + 45$ is equal to 144, find the value of p .
3. For the following, find a quadratic polynomial whose sum and product respectively of the zeroes are as given. Also, find the zeroes of these polynomials by factorization.
 $\frac{21}{8}, \frac{5}{16}$
4. Very-Short-Answer Question:
If $x^3 + x^2 - ax + b$ is divisible by $(x^2 - x)$, write the values of a and b .

Section D

* Given section consists of questions of 5 marks each.

[10]

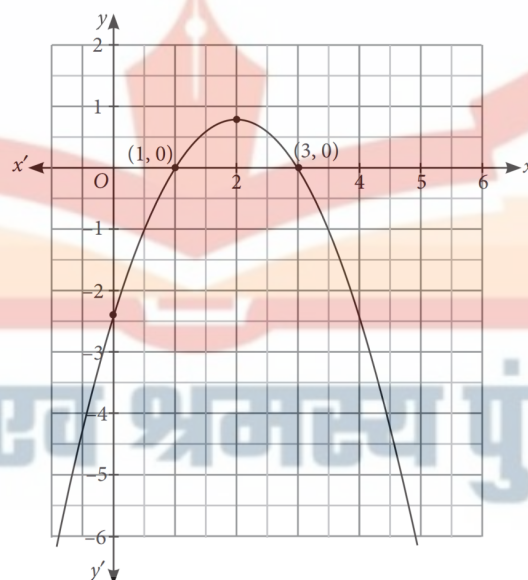
1. Find the condition that the zeros of the polynomial $f(x) = x^3 + 3px^2 + 3qx + r$ may be in A.P.
2. Find all the zeros of the polynomial $(2x^4 - 11x^3 + 7x^2 + 13x)$, it being given that two of its zeros are $3 + \sqrt{2}$ and $3 - \sqrt{2}$.

Section E

* Case study based questions

[4]

1. Priya visited a temple in Gwalior. On the way she sees the Agra Fort. The entrance gate of the fort has a shape of quadratic polynomial (parabolic). The mathematical representation of the gate is shown in the figure.



Based on the above information, answer the following questions.

- i. Find the zeroes of the polynomial represented by the graph.
 - ii. What will be the value of polynomial, represented by the graph, when $x = 4$?
 - iii. What will be the expression for the polynomial represented by the graph?
- Or

If one zero of a polynomial $p(x)$ is 7 and product of its zeroes is -35, then $p(x) =$
?

