CBSE

POLYNOMIALS WS 1

Class 10 - Mathematics

Section A

1. Which of the following is not the graph of a quadratic polynomial? **[1]**

   a)

   b)

   c)

   d)

2. The graph of y = f(x) is shown in the figure for some polynomial f(x). **[1]**

   The number of zeroes of f(x) is

   a) 4　　　　　　　　　　　　　　　　　　b) 8

   c) 6　　　　　　　　　　　　　　　　　　d) 5

3. Which of the following is a polynomial? **[1]**

   i. $x^2 - 5x + 4\sqrt{x} + 3$
   ii. $x^{3/2} - x + x^{1/2} + 1$
   iii. $\sqrt{x} + \frac{1}{\sqrt{x}}$
   iv. $\sqrt{2}x^2 - 3\sqrt{3}x + \sqrt{6}$

   a) Option (iv)　　　　　　　　　　　　　b) Option (ii)

   c) Option (i)　　　　　　　　　　　　　　d) Option (iii)

4. The zeros of the polynomial $4x^2 + 5\sqrt{2}x - 3$ are **[1]**

   a) $-3\sqrt{2}, \frac{\sqrt{3}}{2}$　　　　　　　　b) $\frac{-3\sqrt{2}}{2}, \frac{\sqrt{2}}{4}$

   c) $-3\sqrt{2}, \frac{\sqrt{2}}{2}$　　　　　　　　d) $-3\sqrt{2}, \sqrt{2}$

5. Which of the following is a true statement? **[1]**

a) $5x^3$ is a monomial

b) $x^2 + 5x - 3$ is a linear polynomial

c) x + 1 is a monomial

d) $x^2 + 4x - 1$ is a binomial
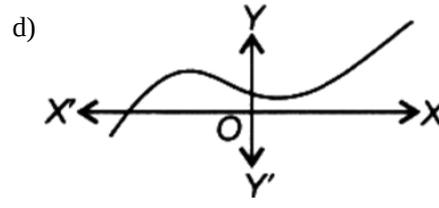
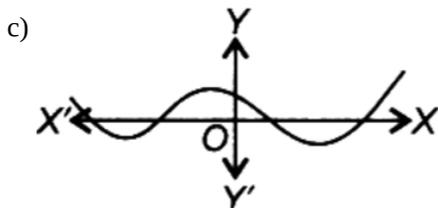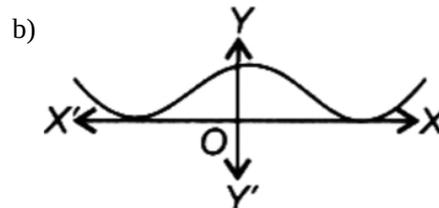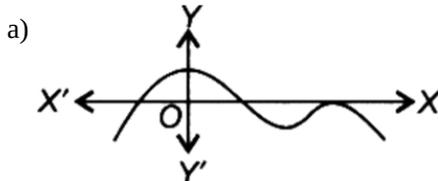6. A polynomial of the form $ax^5 + bx^3 + cx^2 + dx + e$ has atmost _____ zeroes. **[1]**

a) 7

b) 3

c) 11

d) 5

7. Which of the following graph has more than three distinct real roots? **[1]**

a)

b)

c)

d)

8. **Assertion (A):** Graph of a quadratic polynomial is always U shaped upward or downward. **[1]**

Reason (R): Curve of any quadratic polynomial is always symmetric about the fixed-line.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

9. **Assertion (A):** Number zero itself is known as zero polynomial. **[1]**

**Reason (R):** Zero polynomial has only one zero.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

10. **Assertion:** Degree of a zero polynomial is not defined. **[1]**

Reason: Degree of a non-zero constant polynomial is 0

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

c) Assertion is correct statement but reason is wrong statement.

d) Assertion is wrong statement but reason is correct statement.

11. **Assertion (A):** $x^2 + 7x + 12$ has no real zeros **[1]**

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

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

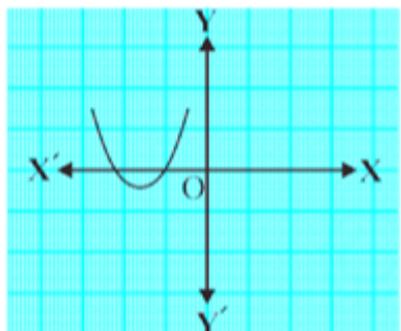12. The graph of y = p(x) in a figure given below, for some polynomial p(x). Find the number of zeroes of p(x). **[1]**
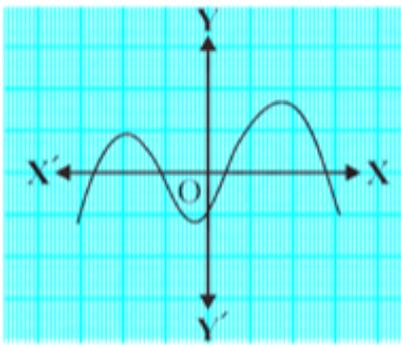
a) 4   b) 2

c) 3   d) 1

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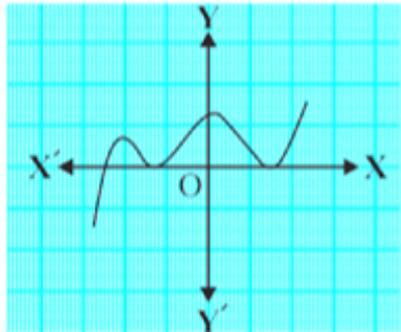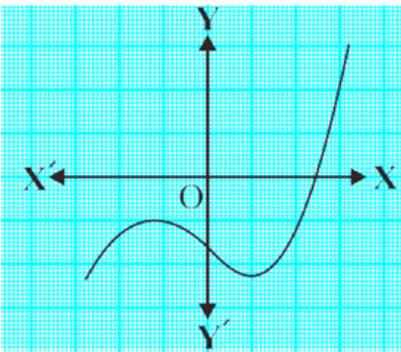

a) 3   b) 4

c) 2   d) 1

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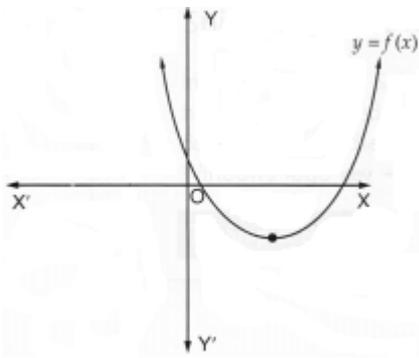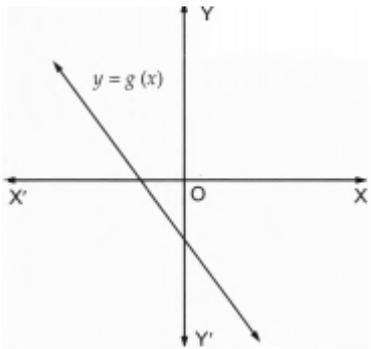

a) 1   b) 4

c) 3   d) 2

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

a) 4   b) 1

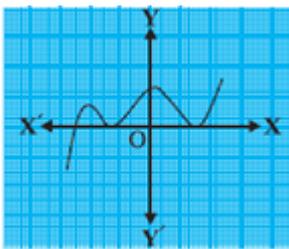c) 2   d) 0

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

    a) 4   b) 0

    c) 1   d) 2

17. Find the number of zeroes of p(x) in the figure given below. **[1]**

    a) 0   b) 1

    c) 3   d) 2

18. Define a polynomial with real coefficients. **[1]**

19. Define zero of a polynomial. **[1]**

20. Find the number of zeroes of $p(x)$. The graph of y = $p(x)$ is given in figure below. **[1]**

21. Find the number of zeroes of $p(x)$. The graph of y = $p(x)$ given in figure below. **[1]**

22. Identify that the graph corresponds to a linear polynomial or a quadratic polynomial. **[1]**

23. Define degree of a polynomial. **[1]**

24. Define value of a polynomial at a point. **[1]**

25. Identify that graph given below corresponds to a linear polynomial or a quadratic polynomial? **[1]**
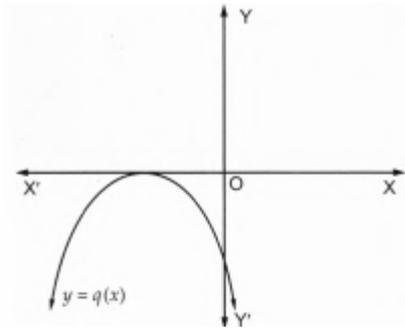
26. Write the standard form of a quadratic polynomial with real coefficients. **[1]**

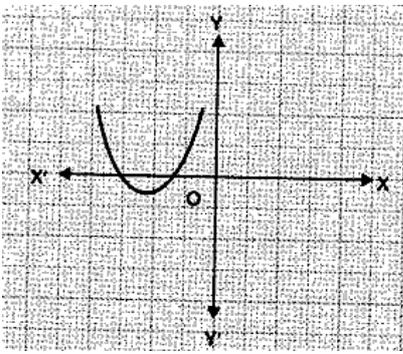27. Identify that the graph corresponds to a linear polynomial or a quadratic polynomial?? **[1]**

28. For a polynomial p(x), the graph of y = p(x) is given below. Find the number of zeroes of p(x). **[1]**

29. In adjoining figure, the graph of a polynomial p(x) is shown. Write the number of zeroes of p(x). **[1]**
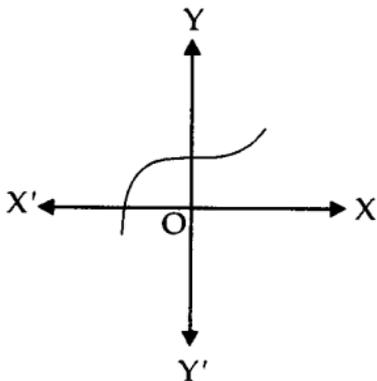
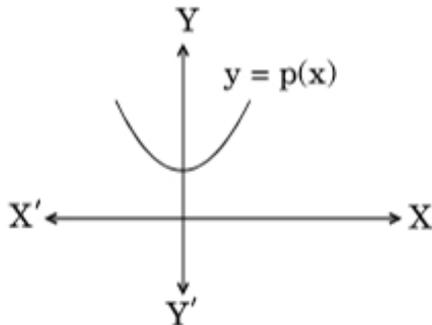30. For a polynomial p(x), the graph of y = p(x) is given below. Find the number of zeroes of p(x). **[1]**

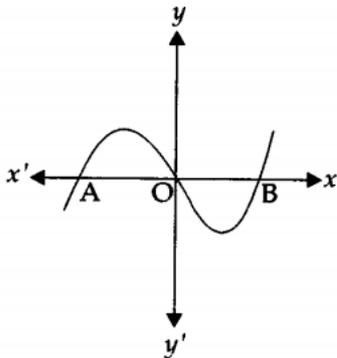31. For a polynomial p(x), the graph of y = p(x) is given below. Find the number of zeroes of p(x). **[1]**
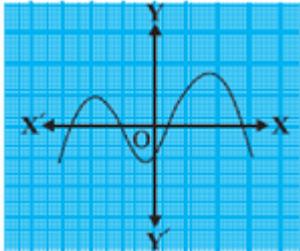
32. Using the graph of a polynomial y = p(x) in Figure, write the number of zeroes of p(x). **[1]**
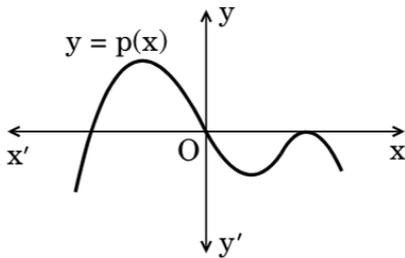
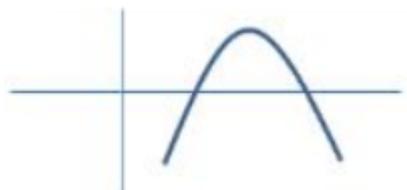33. The graph of y = p(x) is shown in Figure for some polynomial p(x). Find the number of zeroes of p(x). **[1]**

34. The graph of y = f(x) is given in the adjoining figure. Write the number of zeroes of f(x). **[1]**

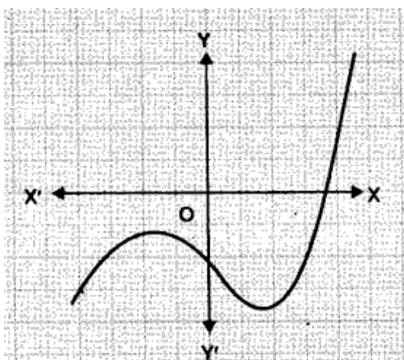**Section B**

35. Match the following table: **[2]**

Graph of polynomial	Type of Polynomial
	(i) Linear polynomial

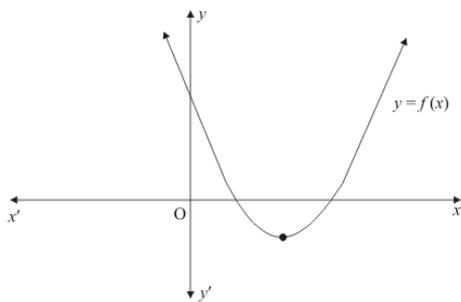|		
(a)		
(b)	(ii) Quadratic polynomial
(c)	(iii) Cubic polynomial
(d)	(iv) Constant polynomial

36. If graph of quadratic polynomial $ax^2 + bx + c$ cuts positive direction of y-axis, then what is the sign of c? **[2]**

37. From the graph of the polnomial $f(x) = ax^2 + bx + c$ as shown in Fig, write the value of $b^2 - 4ac$ and number of real zeros of $f(x)$. **[2]**
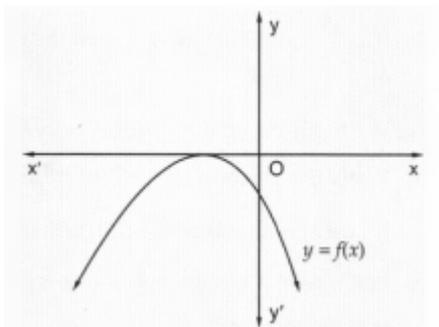
38. For a polynomial p(x), the graph of y = p(x) is given below. Find the number of zeroes of p(x). **[2]**
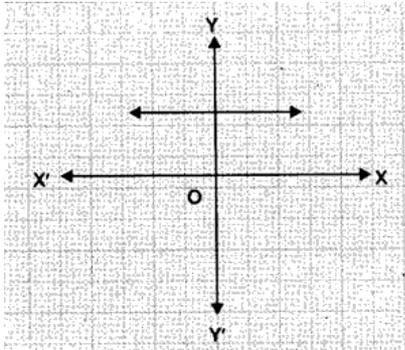

39. The graph of the polynomial $f(x) = ax^2 + bx + c$ is as shown below (Fig.). Write the signs of 'a' and $b^2 - 4ac$ **[2]**
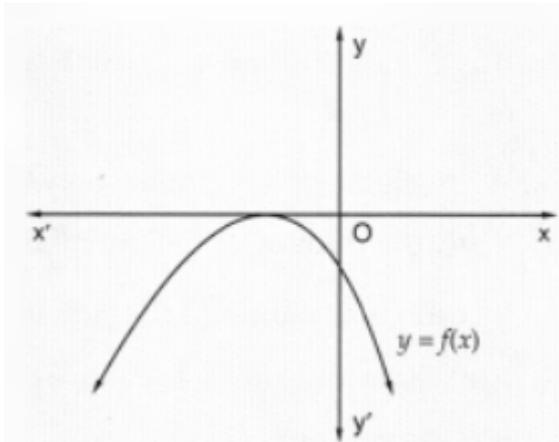
40. If the graph of quadratic polynomial $ax^2 + bx + c$ cuts negative direction of y-axis, then what is the sign of c? **[2]**
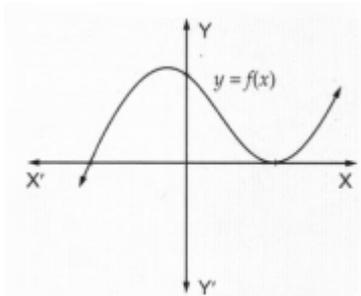
41. For a polynomial p(x), the graph of y = p(x) is given below. Find the number of zeroes of p(x). **[2]**
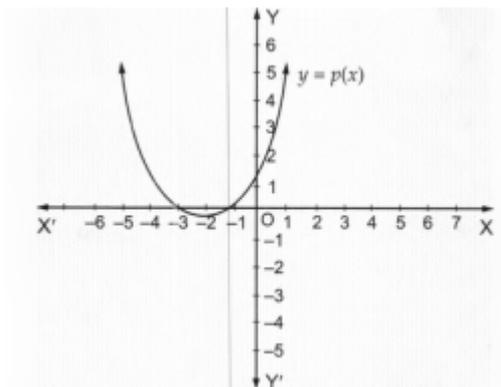

42. The graph of the polynomial $f(x) = ax^2 + bx + c$ as shown in Fig . Write the sign of c. **[2]**
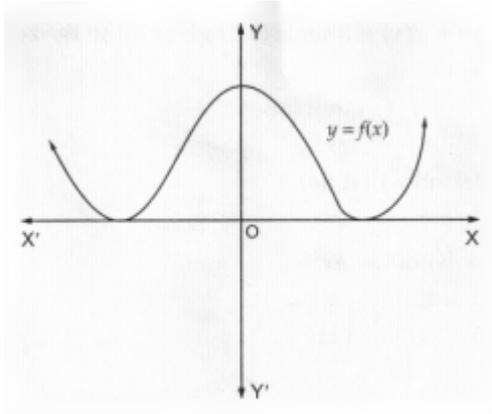

43. Find the number of real zeros of the polynomial y = f(x), having graph as shown in Fig. **[2]**
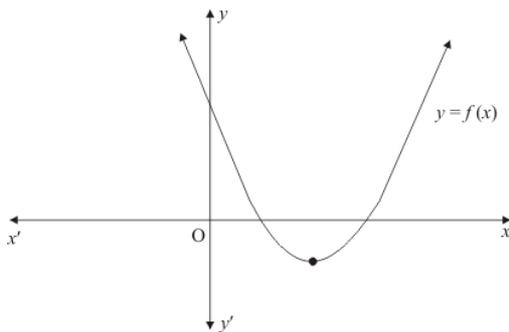

44. In Fig., the graph of a polynomial p(x) is given. Find the zeros of the polynomial. **[2]**

45. Write the number of real zeros of $f(x)$ where graph of a polynomial $f(x)$ is shown in Fig. **[2]**

46. The graph of the polynomial $f(x) = ax^2 + bx + c$ is as shown below. Write the sign of c. **[2]**

Section C

Question No. 47 to 50 are based on the given text. Read the text carefully and answer the questions: **[4]**

Two friends Govind and Pawan decided to go for a trekking. During summer vacation, they went to Panchmarhi. While trekking they observed that the trekking path is in the shape of a parabola. The mathematical representation of the track is shown in the graph.
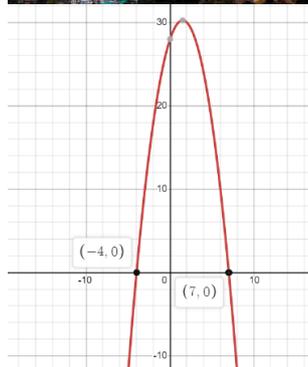

47. What are the zeroes of the polynomial whose graph is given?

48. What will be the expression of the given polynomial p(x)?

49. What is the product of the zeroes of the polynomial which represents the parabola?

50. In the standard form of quadratic polynomial, $ax^2 + bx + c$, whar are a, b, and c?

Question No. 51 to 54 are based on the given text. Read the text carefully and answer the questions: **[4]**

An asana is a body posture, originally and still a general term for a sitting meditation pose, and later extended in hatha yoga and modern yoga as exercise, to any type of pose or position, adding reclining, standing, inverted, twisting, and balancing poses. In the figure, one can observe that poses can be related to representation of quadratic polynomial.

51. Which type the shape of the poses shown in figure?

52. In the graph, how many zeroes are there for the polynomial?
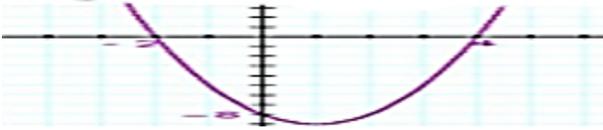
53. Write two zeroes in the shown given graph?
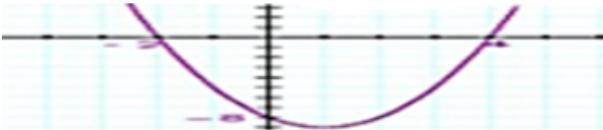
54. How many zeroes are possible for a quadratic polynomial?

Question No. 55 to 58 are based on the given text. Read the text carefully and answer the questions: [4]

Basketball and soccer are played with a spherical ball. Even though an athlete dribbles the ball in both sports, a basketball player uses his hands and a soccer player uses his feet. Usually, soccer is played outdoors on a large field and basketball is played indoor on a court made out of wood. The projectile (path traced) of soccer ball and basketball are in the form of parabola representing quadratic polynomial.

55. Which type the shape of the path traced shown in given figure?

56. Why the graph of parabola opens upwards?

57. In the below graph, how many zeroes are there?

58. What is the condition for the graph of parabola to open downwards?

Question No. 59 to 62 are based on the given text. Read the text carefully and answer the questions: [4]

While playing in a garden, Samaira saw a honeycomb and asked her mother what is that. Her mother replied that it's a honeycomb made by honey bees to store honey. Also, she told her that the shape of the honeycomb formed is a mathematical structure. The mathematical representation of the honeycomb is shown in the graph.
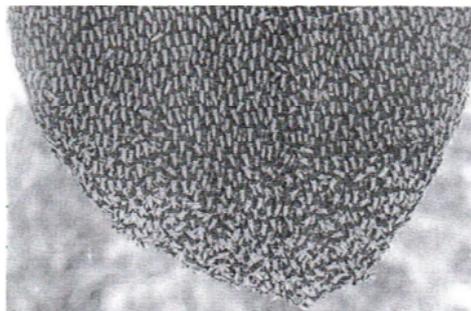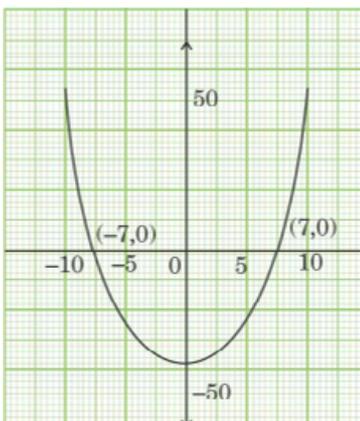
59. How many zeroes are there for the polynomial represented by the graph given?

60. Write the zeroes of the polynomial.

61. If the zeroes of a polynomial $x^2 + (a + 1) x + b$ are 2 and -3, then determine the values of a and b.

62. If the square of difference of the zeroes of the polynomial $x^2 + px + 45$ is 144, then find the value of p.
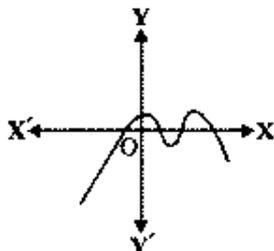
Section D

63. **Fill in the blanks:** **[6]**

   (a)   The graph of y = p(x) is given in figure below, for some polynomial p(x). The number of zeroes of **[1]** p(x) is _____.

   (b)   A polynomial of degree four is called _____ polynomial. **[1]**

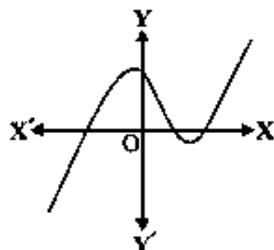   (c)   The geometrical representation of ax + by + c = 0 is a _____ . **[1]**

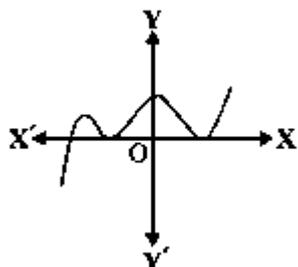   (d)   The highest power of x in a polynomial f(x), is called the _____ of the polynomial f(x). **[1]**

   (e)   The graph of y = p(x) is given in the figure below, for some polynomial p(x). The number of zeroes of **[1]** p(x) is _____.

   (f)   The graph of y = p(x) are given in the fig. below, for some polynomial p(x). The number of zeroes of **[1]** p(x) is _____.

Section E

64. **State True or False:** **[7]**

   (a)   A polynomial of degree one, is called linear Polynomial. **[1]**

   (b)   1, 2 are the zeroes of $x^2 - 3x + 2$. **[1]**

   (c)   Every linear polynomial has only one zero. **[1]**

   (d)   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 **[1]** is non-negative.

   (e)   If the graph of a polynomial intersects the x - axis at exactly two points, it need not be a quadratic **[1]** polynomial. Justify your answer.

   (f)   If the graph of a polynomial intersects the x-axis at only one point it need not be a quadratic **[1]**

polynomial. Justify your answer.

(g) The zeros of the polynomial x^2 - 2x - 3 are 3, -1. **[1]**