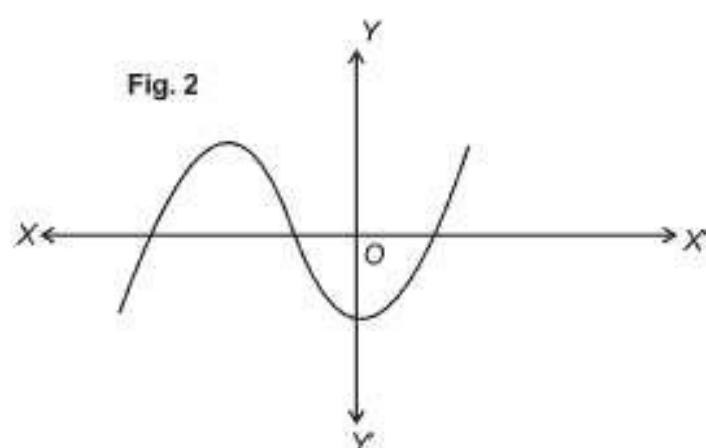


## 2 : Polynomials

1. If  $(x + a)$  is a factor of  $2x^2 + 2ax + 5x + 10$ , find  $a$ . [2008] ...[1M]
2. If 1 is a zero of the polynomial  $p(x) = ax^2 - 3(a - 1)x - 1$ , then find the value of  $a$ . [2009] ...[1M]
3. If  $\alpha, \beta$  are the zeroes of a polynomial, such that  $\alpha + \beta = 6$  and  $\alpha\beta = 4$ , then write the polynomial. [2010] ...[1M]
4. If one zero of a quadratic polynomial  $(kx^2 + 3x + k)$  is 2, then the value of  $k$  is [2020] ...[1M]

- (a)  $\frac{5}{6}$  (b)  $-\frac{5}{6}$   
(c)  $\frac{6}{5}$  (d)  $-\frac{6}{5}$

5. The graph of a polynomial is shown in Fig. 2, then the number of its zeroes is [2020] ...[1M]



- (a) 3 (b) 1  
(c) 2 (d) 4
6. If one of the zeroes of the quadratic polynomial  $x^2 + 3x + k$  is 2, then the value of  $k$  is [2020] ...[1M]
- (a) 10 (b) -10  
(c) -7 (d) -2
7. The quadratic polynomial, the sum of whose zeroes is -5 and their product is 6, is [2020] ...[1M]
- (a)  $x^2 + 5x + 6$   
(b)  $x^2 - 5x + 6$   
(c)  $x^2 - 5x - 6$   
(d)  $-x^2 + 5x + 6$

8. A quadratic polynomial having sum and product of its zeroes as 5 and 0 respectively, is [2021] ...[1M]

- (a)  $x^2 + 5x$  (b)  $2x(x - 5)$   
(c)  $5x^2 - 1$  (d)  $x^2 - 5x + 5$

9. Zeroes of a quadratic polynomial  $x^2 - 5x + 6$  are [2021] ...[1M]

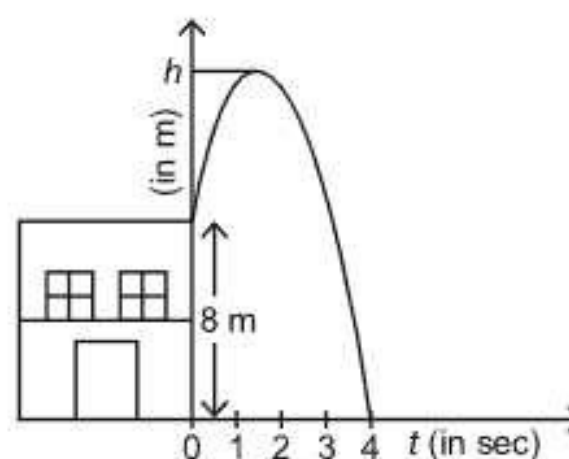
- (a) -5, 1 (b) 5, 1  
(c) 2, 3 (d) -2, -3

10. The zeroes of quadratic polynomial  $x^2 + 99x + 127$  are [2021] ...[1M]

- (a) Both negative  
(b) Both positive  
(c) One positive and one negative  
(d) Reciprocal of each other

**Case Study Based Questions (Q.11 to Q.15) :** Sukriti throws a ball upwards, from a rooftop which is 8 m high from ground level. The ball reaches to some maximum height and then returns and hit the ground. If height of the ball at time  $t$  (in sec) is represented by  $h(m)$ , then equation of its path is given as  $h = -t^2 + 2t + 8$

Based on above information, answer the following:



11. The maximum height achieved by ball is [2021] ...[1M]
- (a) 7 m (b) 8 m  
(c) 9 m (d) 10 m
12. The polynomial represented by above graph is [2021] ...[1M]
- (a) Linear polynomial  
(b) Quadratic polynomial  
(c) Constant polynomial  
(d) Cubic polynomial

13. Time taken by ball to reach maximum height is

[2021] ...[1M]

- (a) 2 sec. (b) 4 sec.  
(c) 1 sec. (d) 2 min.

14. Number of zeroes of the polynomial whose graph is given, is

[2021] ...[1M]

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

15. Zeroes of the polynomial are

[2021] ...[1M]

- (a) 4 (b) -2, 4  
(c) 2, 4 (d) 0, 4

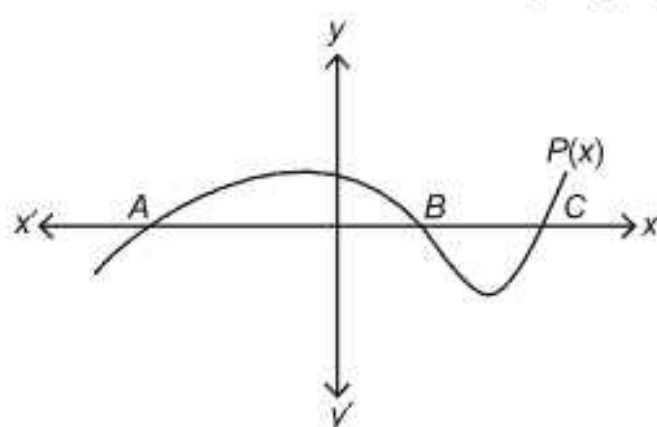
16. The graph of a polynomial  $P(x)$  cuts the  $x$ -axis at 3 points and touches it at 2 other points. The number of zeroes of  $P(x)$  is

[2021] ...[1M]

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

17. In figure, the graph of a polynomial  $P(x)$  is shown. The number of zeroes of  $P(x)$  is

[2021] ...[1M]



- (a) 1 (b) 2  
(c) 3 (d) 4

18. A quadratic polynomial, the product and sum of whose zeroes are 5 and 8 respectively is

[2021] ...[1M]

- (a)  $k[x^2 - 8x + 5]$  (b)  $k[x^2 + 8x + 5]$   
(c)  $k[x^2 - 5x + 8]$  (d)  $k[x^2 + 5x + 8]$

19. If  $x - 1$  is a factor of the polynomial  $p(x) = x^3 + ax^2 + 2b$  and  $a + b = 4$ , then

[2021] ...[1M]

- (a)  $a = 5, b = -1$   
(b)  $a = 9, b = -5$   
(c)  $a = 7, b = -3$   
(d)  $a = 3, b = 1$

20. If  $\alpha, \beta$  are the zeroes of the quadratic polynomial  $p(x) = x^2 - (k + 6)x + 2(2k - 1)$ , then the value

of  $k$ , if  $\alpha + \beta = \frac{1}{2}\alpha\beta$ , is

[2021] ...[1M]

- (a) -7 (b) 7  
(c) -3 (d) 3

21. If  $p(x) = x^2 + 5x + 6$ , then  $p(-2)$  is

[2023] ...[1M]

- (a) 20 (b) 0  
(c) -8 (d) 8

22. A quadratic polynomial whose sum and product of zeroes are 2 and -1 respectively is

[2023] ...[1M]

- (a)  $x^2 + 2x + 1$  (b)  $x^2 - 2x - 1$   
(c)  $x^2 + 2x - 1$  (d)  $x^2 - 2x + 1$

23. If  $\alpha, \beta$  are zeroes of the polynomial  $x^2 - 1$ , then the value of  $(\alpha + \beta)$  is

[2023] ...[1M]

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

24. If  $\alpha, \beta$  are the zeroes of the polynomial

$p(x) = 4x^2 - 3x - 7$ , then  $\left(\frac{1}{\alpha} + \frac{1}{\beta}\right)$  is equal to:

[2023] ...[1M]

- (a)  $\frac{7}{3}$  (b)  $-\frac{7}{3}$   
(c)  $\frac{3}{7}$  (d)  $-\frac{3}{7}$

25. If one zero of the polynomial  $p(x) = 6x^2 + 37x - (k - 2)$  is reciprocal of the other, then find the value of  $k$ .

[2023] ...[2M]

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

[2019] ...[3M]

27. If  $\alpha$  and  $\beta$  are the zeroes of the polynomial  $f(x) = x^2 - 4x - 5$ , then find the value of  $\alpha^2 + \beta^2$ .

[2020] ...[3M]

28. Find a quadratic polynomial whose zeroes are reciprocals of the zeroes of the polynomial  $f(x) = ax^2 + bx + c$ ,  $a \neq 0, c \neq 0$ .

[2020] ...[3M]

29. If  $\alpha, \beta$  are zeroes of the quadratic polynomial  $x^2 - 5x + 6$ , form another quadratic polynomial

whose zeroes are  $\frac{1}{\alpha}, \frac{1}{\beta}$ .

[2023] ...[3M]