



# SHIKSHA CLASSES

Sub. : Maths.  
Std. X (CBSE)

Question Paper  
2 : Polynomials.

Total Marks : 30  
Time : 1 hour

Section : A (Each 1 Mark)

### Multiple choice Questions (MCQs).

Q.1 : The quadratic polynomial whose sum of zeroes is 3 and product of zeroes is  $-2$  is :

- a)  $x^2 + 3x - 2$                       b)  $x^2 - 2x + 3$   
c)  $x^2 - 3x + 2$                       d)  $x^2 - 3x - 2$

Q.2 : The zeroes of  $x^2 - 2x - 8$  are:

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

Q.3 : If the zeroes of the quadratic polynomial  $ax^2 + bx + c = 0$ ,  $a \neq 0$  are equal, then

- a)  $c$  and  $b$  have opposite signs              b)  $c$  and  $a$  have opposite signs  
c)  $c$  and  $b$  have same signs              d)  $c$  and  $a$  have same signs

Q.4 : If  $p(x)$  is a polynomial of degree one and  $p(a) = 0$ , then  $a$  is said to be:

- a) Zero of  $p(x)$                       b) Value of  $p(x)$   
c) Constant of  $p(x)$                       d) None of the above

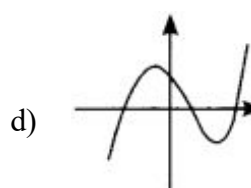
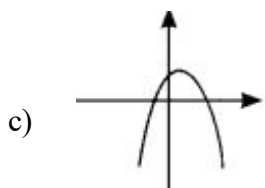
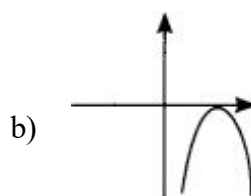
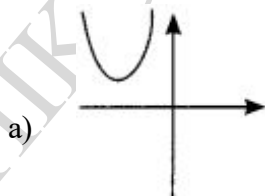
Q.5 : If one zero of the quadratic polynomial  $x^2 + 3x + k$  is  $2$ , then the value of  $k$  is

- a)  $10$                       b)  $-10$                       c)  $5$                       d)  $-5$

Q.6 : 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)  $-\frac{2}{3}$

Q.7 : Which of the following is not the graph of quadratic polynomial?



Q.8 : If  $x^3 + 11$  is divided by  $x^2 - 3$ , then the possible degree of remainder is  
a) 0                      b) 1                      c) 2                      d) less than 2

Q.9 : The number of polynomials having zeroes as -2 and 5 is.  
a) 1                      b) 2                      c) 3                      d) more than 3

**For question number 10 to 11 two statements are given one labeled Assertion and other labeled Reason select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below**

- 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.

Q.10 : **Assertion:**  $x^2 + 7x + 12$  has no real zeroes.

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

Q.11 : **Assertion:** If one zero of polynomial  $p(x) = (k^2 + 4)x^2 + 13x + 4k$  is reciprocal of the other, then  $k = 2$ .

**Reason:** If  $(x-a)$  is a factor of  $p(x)$ , then  $p(a) = 0$  i.e.,  $a$  is a zero of  $p(x)$ .

### Section : B (Each 2 Marks)

Q.12 : Find the zeroes of polynomial  $x^2 - 3$  and verify the relationship between the zeroes and the coefficients.

Q.13 : If  $\alpha$  and  $\beta$  are zeroes of the quadratic polynomial  $f(x) = x^2 - x - 4$  find the value of

$$\frac{1}{\alpha} + \frac{1}{\beta} - \alpha\beta$$

**OR**

If the sum of the zeroes of the quadratic polynomial  $kx^2 + 3x + 5k$  is equal to their product find the value of  $k$ .

### Section : C (Each 3 Marks)

Q.14 : Compute the zeroes of the polynomial  $4x^2 - 4x - 8$ . Also, establish a relationship between the zeroes and coefficients.

Q.15 :  $\alpha$  and  $\beta$  are zeroes of the quadratic polynomial  $x^2 - 6x + y$ . Find the value of 'y' if  $3\alpha + 2\beta = 20$ .

**OR**

Find a quadratic polynomial, the sum and product of whose zeroes are 0 and  $\frac{-3}{5}$  respectively.

Hence find the zeroes.

**Section - D(Each 5 Marks)**

Q.16 : If  $\alpha$  and  $\beta$  are zeroes of the polynomial  $p(x) = 2x^2 - 7x + k$  satisfying the condition

$$\alpha^2 + \beta^2 + \alpha\beta = \frac{67}{4}, \text{ then find value of } k \text{ for this to be possible.}$$

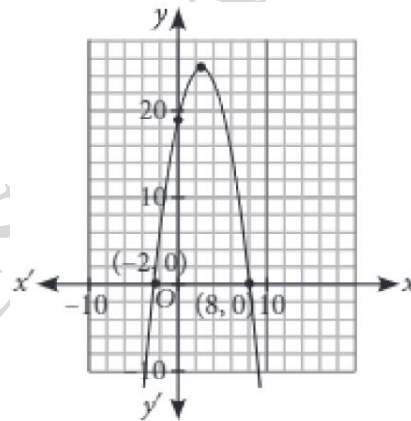
**OR**

If  $\alpha$  and  $\beta$  are the zeroes of  $p(x) = kx^2 - 4x + 4$  such that  $\alpha^2 + \beta^2 = 24$ , find  $k$ .

**Section : E**

Q.17 : **Case Study :**

Priya and her husband Aman who is an architect by profession, visited France. They went to see Mont Blanc Tunnel which is a highway tunnel between France and Italy, under the Mont Blanc Mountain in the Alps, and has a parabolic cross-section. The mathematical representation of the tunnel is shown in the graph.



Based on the above information, answer the following questions.

- i) What is the zeroes of the polynomial whose graph is given ? 1
- ii) What will be the expression of the polynomial given in diagram? 1
- iii) What is the value of the polynomial. represented by the graph, when  $x = 4$ ? 2

**OR**

If one of the zero is 4 and sum of zeroes is  $-3$ , then find the representation of tunnel as a polynomial .

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