[SINGLE CORRECT CHOICE TYPE]

Q.1 to Q. 15 has four choices (A), (B), (C), (D) out of which **ONLY ONE** is correct.

1. The values of the parameter 'a' for which the quadratic equations $(1-2a)x^2-6ax-1=0$ and $ax^2-x+1=0$ have at least one root common, are

(A) 0, 1/2 (B) 1/2, 2/9 (C) 2/9 (D) 1/3, 1/2, 2/9

2. If $\alpha+\beta=3$ and $\alpha^3+\beta^3=7$, then α and β are the roots of the equation

(A) $3x^2+9x+7=0$ (B) $9x^2-27x+20=0$ (C) $2x^2-6x+15=0$ (D) none of these

3. If α, β are roots of the equation $ax^2+bx+c=0$, then the equation whose roots are $2\alpha+3\beta$ and $3\alpha+2\beta$ is

(A) $abx^2-(a+b)cx+(a+b)^2=0$ (B) $acx^2-(a+c)bx+(a+c)^2=0$

(C) $acx^2+(a+c)bx-(a+c)^2=0$ (D) None of these

4. The equations $ax^2+bx+a=0(a,b\in R)$ and $x^3-2x^2+2x-1=0$ have 2 roots common. Then a + b must be equal to

(A) 1 (B) -1 (C) 0 (D) None of these

5. The value of m for which the equation $\frac{a}{x+a+m}+\frac{b}{x+b+m}=1$ has roots equal in magnitude and opposite in signs is

(A) $\frac{a-b}{a+b}$ (B) –1 (C) 0 (D) $\frac{a+b}{a-b}$

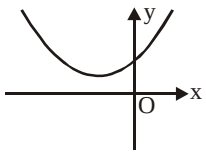
6. If the product of 2 positive numbers is 9, then the possible value of the sum of their reciprocals lies in the interval

(A) $\left[\frac{1}{3},\ \infty\right)$ (B) $[1,\ \infty)$ (C) $\left[\frac{4}{9},\ \infty\right)$ (D) $\left[\frac{2}{3},\ \infty\right)$

7. If $(49)^{3\log_{\sqrt{343}}\sqrt{x}}-2x-3=0$, then x is equal to

(A) –1 (B) 3 (C) –1, 3 (D) 2, 3

8. The curve of the quadratic expression $y = ax^2 + bx + c$ is shown in the figure and α,β be the roots of the equation $ax^2 + bx + c = 0$ then correct option is [D is the discriminant]



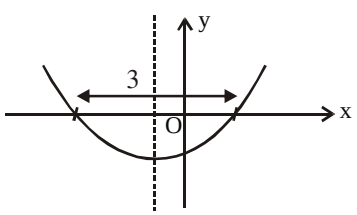
(A) $a > 0, b > 0, c > 0, D > 0, \alpha+\beta > 0, \alpha\beta > 0$

(B) $a > 0, b > 0, c > 0, D < 0, \alpha+\beta < 0, \alpha\beta < 0$

(C) $a > 0, b > 0, c > 0, D < 0, \alpha+\beta < 0, \alpha\beta > 0$

(D) $a > 0, b < 0, c > 0, D < 0, \alpha+\beta > 0, \alpha\beta > 0$

9. If graph of $f(x) = x^2 + bx + c$ is drawn in adjacent diagram, where $b, c \in I$, then number of such quadratic equation $f(x) = 0$ is



(A) 1

(B) 2

(C) 3

(D) 4

10. The value of 'a' for which the equation $x^7 + ax^2 + 3 = 0$ and $x^8 + ax^3 + 3 = 0$ have a common root, can be

(A) 1 (B) –2 (C) –3 (D) –4

11. If $x^2 + 3x + 3 = 0$ and $ax^2 + bx + 1 = 0$, $a, b \in Q$ have a common root, then value of $(3a + b)$ is equal to

(A) 1/3 (B) 1 (C) 2 (D) 4

12. The number of integral values of k for which the curve $y = x^2 + kx + 4$ touches the x axis is

(A) 0 (B) 1 (C) 2 (D) 4

13. If α, β are the roots of $x^2 - px + r = 0$ and $\alpha + 1, \beta - 1$ are the roots of $x^2 - qx + r = 0$, then r is

(A) $\frac{p-1}{4}$ (B) $\frac{q+1}{4}$ (C) $\frac{p^2-1}{4}$ (D) $\frac{q^2+1}{4}$

14. If the roots of the equation $x^2 - bx + c = 0$ are two consecutive integers, then $b^2 - 4c$ equals.

(A) –2 (B) 3 (C) 2 (D) 1

15. The sum of all values of p for which the vertex of the parabola $y = x^2 + 2px + 13$ lie at a distance of 5 from the origin, is

(A) 0 (B) 6 (C) 7 (D) 8

[MULTIPLE CORRECT CHOICE TYPE]

Q.16 to Q.17 has four choices (A), (B), (C), (D) out of which **ONE OR MORE** may be correct

16. If equations $ax^2 - (a + b)x + b = 0$ & $bx^2 + (b - c)x - c = 0$ has exactly one root in common $\{a, b, c \neq 0\}$, then which of the following can be correct

(A) $b^2 = ac$ (B) $-a = b \neq c$ (C) $b = a \neq c$ (D) $-a \neq b = c$

17. If one of the roots of $x^2 - bx + c = 0$, $b\ c \in Q$ is $\sqrt{7-4\sqrt{3}}$ then

(A) $\log_b c = 0$ (B) $b + c = 5$ (C) $\log_c b = 0$ (D) $bc = -4$

[COMPREHENSION TYPE]

Paragraph for Question 18 to 20

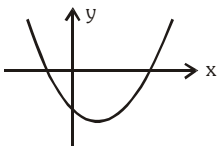
Consider the quadratic expression $y = x^2 - px + q$ where $p, q \in R$.

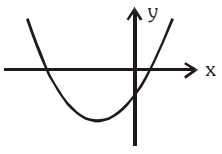
On the basis of above information, answer the following questions :

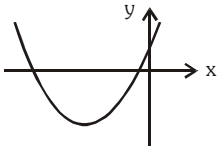
18. If $p = 4$ and $q = 9$, then minimum value of the expression is

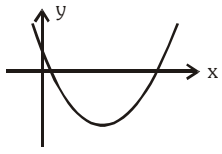
(A) 3 (B) 4 (C) 5 (D) 6

19. If $p < 0$ & $q < 0$, then the possible graph of $y = x^2 - px + q$ is

(A) 

(B) 

(C) 

(D) 

20. If p is positive odd integer and roots of equation $y = 0$ are prime numbers and $p + q = 23$, then absolute value of difference of roots is

(A) 1 (B) 2 (C) 3 (D) 5

Answers

RACE # 17

1. (C) **2.** (B) **3.** (D) **4.** (C) **5.** (C) **6.** (D) **7.** (B) **8.** (C) **9.** (A) **10.** (D)
11. (C) **12.** (C) **13.** (C) **14.** (D) **15.** (A) **16.** (ABD) **17.** (A,B) **18.** (C)
19. (B) **20.** (D)