Special Algebra By Alok Sir

Type-XI

1. If $a = 556, b = 558$ and $c = 561$. Find the value of $a^2 + b^2 + c^2 - ab - bc - ca$

(a) 7

(b) 19

(c) -19

(d) 6

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2. If $a = x + y$, $b = x - y$ and $c = x + 2y$, then $a^2 + b^2 + c^2 - ab - bc - ca$ is

(a) $4y^2$

(b) $5y^2$

(c) $6y^2$

(d) $7y^2$

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3. If $3(a^2 + b^2 + c^2) = (a + b + c)^2$ then the relation between a,b & c is

(a) $a = b = c$

(b) $a = b \neq c$

(c) $a < b < c$

(d) $a > b > c$.

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4. If $a = 4.36, b = 2.39$ and $c = 1.97$ then the value of $a^3 - b^3 - c^3 - 3abc$ is

(a) 3.94

(b) 2.39

(c) 0

(d) 1

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5. If $x + y = z$ then $x^3 + y^3 - z^3 + 3xyz$ is equal to

(a) 0

(b) $3xyz$

(c) $-3xyz$

(d) 1

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6. If $a = 3.23, b = 5.95$ and $c = 2.72$ then the value of $a^3 - b^3 + c^3 + 3\,abc$ is

(a) 0

(b) 1

(c) 2

(d) 3

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7. If $a + b + c = 6$, $a^2 + b^2 + c^2 = 14$ and $a^3 + b^3 + c^3 = 36$. Find the value of abc.

(a) 3

(b) 6

(c) 9

(d) 12

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8. If $x^3 + \dfrac{3}{x} = 4(a^3 + b^3)$ and $3x + \dfrac{1}{x^3} = 4(a^3 + b^3)$

then $a^2 - b^2$ is equal to

(a) 4

(b) 0

(c) 1

(d) 2

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9. If $a^3 + b^3 = 9$ and $a + b = 3$ then $\dfrac{1}{a} + \dfrac{1}{b}$ is

(a) $\dfrac{1}{2}$

(b) $\dfrac{3}{2}$

(c) $\dfrac{5}{2}$

(d) -4

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10. If $x = (b-c)(a-d), y = (c-a)(b-d), z = (a-b)(c-d)$ then the value of $x^3 + y^3 + z^3$ is equal to

(a) xyz

(b) $2xyz$

(c) $3xyz$

(d) $-3xyz$

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11. If $x + y + z = 15$, and $xy + yz + zx = 75$ then.

Find $\dfrac{x + 4y + z}{3z}$

(a) 1

(b) 0

(c) 2

(d) -1

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12. Find the minimum value of given expression $5x^2 - 8x + 14$

(a) $-\dfrac{54}{5}$

(b) $\dfrac{55}{8}$

(c) $\dfrac{54}{5}$

(d) $\dfrac{64}{5}$

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13. Find the maximum value of $5 - 12x - 3x^2$

(a) $\dfrac{17}{2}$

(b) $\dfrac{21}{17}$

(c) 17

(d) $\dfrac{35}{18}$

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14. Find the value of x for which $2 - 3x - 4x^2$ has the greatest value?

(a) $-\dfrac{41}{16}$

(b) $\dfrac{3}{8}$

(c) $-\dfrac{3}{8}$

(d) $\dfrac{41}{16}$

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15. Find the minimum value of $x^2 + \dfrac{1}{x^2 + 1} - 4$

(a) -3

(b) -2

(c) 0

(d) 4

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16. Find the maximum value of $\dfrac{1}{x^2 + 5x + 10}$

(a) $\dfrac{15}{2}$

(b) 1

(c) $\dfrac{4}{15}$

(d) 2

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17. Find the maximum value of the expression
$x^2 + 8x + 20$

(a) 4

(b) 2

(c) 29

(d) None

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18. Find the minimum value of **x** which the expression $x^3 - 7x^2 + 11x - 5 \geq 0$.

(a) 0

(b) 5

(c) 1

(d) -3

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19. Find the maximum value of $(x - 1)(y - 2)(z + 3)$ if $x + y + z = 24$

(a) 510

(b) 512

(c) 515

(d) 256

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20. If $a + b + c + d = 1$, then the maximum value of $(1 + a)(1 + b)(1 + c)(1 + d)$ is

(a) 1

(b) $\left(\dfrac{1}{2}\right)^3$

(c) $\left(\dfrac{3}{4}\right)^3$

(d) $\left(\dfrac{5}{4}\right)^4$

Type-XII

21. If $x \in R$ then the maximum value of $(\sqrt{3} - x + 5)$ is

(a) $\sqrt{3}$

(b) 5

(c) 3

(d) $\sqrt{3} + 5$

Type-XII

22. If a, b, c, are positive real numbers, the least value of $(a+b+c)\left(\dfrac{1}{a}+\dfrac{1}{b}+\dfrac{1}{c}\right)$ is

(a) 1

(b) 9

(c) 12

(d) None of these