IEM KOLKATA

Algebra

Instructor: Akash Bhattacharya

Q1) Solve for x: $2^{x+2} = 64$
(a) 3 (b) 4 (c) 5 (d) 6

Q2) What will be the value of c, if $a(a+b+c) = 85$, $b(a+b+c) = 96$, $c(a+b+c) = 108$?

Q3) Find the value of $M - \frac{1}{M}$, if $M + \frac{1}{M} = 4$?

Q4) Find value of $\frac{a^2+2a+b^2}{a^3-2a^2}$, if $a + \frac{b^2}{a} = 2$?

Q5) Find value of $a^3 + b^3 + 3ab$, when value of $a + b = 1$?

Q6) If $a + b = 7$ and $ab = 10$, what is the value of $(a^3 + b^3)$?
(a) 133 (b) 157 (c) 175 (d) 191

Q7) If $l + m + n = 0$ then $l^3 + m^3 + n^3$ would be equal to:
(a) $3lmn$ (b) $\frac{(lm+mn+ln)}{lmn}$ (c) $lmn(ln + lm + nm)$ (d) $\frac{(l^2+m^2+n^2)}{lmn}$

Q8) If $a - \frac{1}{a} = 2$, then calculate the value of $a^4 + \frac{1}{a^4}$?
(a) 14 (b) 85 (c) 34 (d) 0

Q9) If $x^2 - 8x - 1 = 0$, then what is the value of $x^2 + \frac{1}{x^2}$?
(a) 68 (b) 62 (c) 64 (d) 66

Q10) What will be the value of $(m + n)$ if we know that $\sqrt{28 - 6\sqrt{3}} = \sqrt{3}m + n$?
(a) 1 (b) 2 (c) 3 (d) -1

Q11) If $x^2 + 4x + k = 0$ has real roots, what is the range of values for k ?
(a) $k \leq 4$ (b) $k \geq 4$ (c) $k \leq -4$ (d) $k \geq -4$

Q12) What is the number of real solutions of the equation $x^2 - 7|x| - 18 = 0$?
(a) 2 (b) 4 (c) 3 (d) 1

Q13) Sum of the roots of a quadratic equation is 5 less than the product of the roots. If one root is 1 more than the other root, find the product of the roots?
(a) 6 or 3 (b) 12 or 2 (c) 8 or 4 (d) 12 or 4