IEM KOLKATA

Algebra

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Q1) If $3^{(x-y)} = 27$ and $3^{(x+y)} = 243$, then x is equal to:
(a) 0 (b) 2 (c) 4 (d) 6

Q2) If $9^x - 9^{x-1} = 648$, then find the value of x^x
A. 4 B. 9 C. 27 D. 64

Q3) If $4^{(x-y)} = 64$ and $4^{(x+y)} = 1024$, then find the value of x.
A. 3 B. 1 C. 6 D. 4

Q4) If $x = \sqrt{2} + 1$ and $y = 1 - \sqrt{2}$ then the value of $x^2 + y^2 + xy$ will be
(a) 6 (b) 5 (c) 7 (d) 9

Q5) If $x = 8 + \sqrt[3]{7}$, what is the value of $\sqrt{x} - \frac{1}{\sqrt{x}}$?
(a) $\sqrt{13}$ (b) $\sqrt{14}$ (c) $\sqrt{15}$ (d) $\sqrt{16}$

Q6) If $a + b + c + d = 1$, then the maximum value of $(1 + a)(1 + b)(1 + c)(1 + d)$?
(a) $\frac{5}{2}$ (b) $\frac{6}{7}$ (c) $\left(\frac{5}{4}\right)^4$ (d) $\left(\frac{3}{4}\right)^2$

Q7) If $x + \frac{1}{x} = -2$ then the value of $x^{1000} + x^{-1000}$ is?
(a) 5 (b) 2 (c) 1 (d) 3

Q8) If $x + \frac{1}{x} = -\sqrt{3}$, then find the value of $x^{17} + \frac{1}{x^{17}}$.

Q9) If $x + \frac{1}{x} = -1$, then find the value of $x^{18} + \frac{1}{x^{18}}$.

Q10) If $ab = 5$, $bc = 10$, $ca = 5$, then $a + b + c =$?