Q.1 Let $n = \sqrt{6+\sqrt{11}} + \sqrt{6-\sqrt{11}} - \sqrt{22}$ then

(A) $n \geq 1$ (B) $0 < n < 1$ (C*) $n = 0$ (D) $-1 < n < 0$

Q.2 If $\log_a b = 2$; $\log_b c = 2$ and $\log_3 c = 3 + \log_3 a$ then $(a + b + c)$ equals

(A) 90   (B*) 93   (C) 102   (D) 243

Q.3 If $x + y = 1$ and $x^2 + y^2 = 2$ then the value of $(x^5 + y^5)$ equals

(A) 7   (B) 6   (C) $\dfrac{23}{4}$ (D*) $\dfrac{19}{4}$

Q.4 Number of real numbers x satisfying the equation

$$\log_3 x - 2 = \sqrt{\log_3 x^3 - 8} \text{ is}$$

(A) 0   (B) 1   (C*) 2   (D) 3

[MATCH THE COLUMN]   [3+3+3+3=12]

Q.5   **Column-I**   **Column-II**

(A) Anti logarithm of $(0.\overline{6})$ to the base 27 has the value equal to   (P)   5

(B) Characteristic of the logarithm of 2008 to the base 2 is

(C) The value of b satisfying the equation,   (Q)   7
$\log_e 2 \cdot \log_b 625 = \log_{10} 16 \cdot \log_e 10$ is

(D) Number of naughts after decimal before a significant figure   (R)   9

comes in the number $\left(\dfrac{5}{6}\right)^{100}$, is   (S)   10

[Ans. (A) R; (B) S; (C) P; (D) Q]

[SUBJECTIVE]

Q.6 Solve the equation, $\sqrt{\log(-x)} = \log\sqrt{x^2}$ (base is 10) [Ans. $x = -1$ and $x = -10$]   **[3]**

Q.7 The length of a common internal tangent to two circles is 7 and a common external tangent is 11. Compute the product of the radii of the two circles.   **[4]**

[Ans. : 18]

Q.8 If $2\left(\sqrt{3+\sqrt{5-\sqrt{13+\sqrt{48}}}}\right) = \sqrt{a} + \sqrt{b}$ where a and b are natural number find $(a + b)$.   **[5]**

[Ans. 8]