1. If 1, α_1, α_2,……α_{n-1} are the n roots of unity, then $(1 - \alpha_1)(1 - \alpha_2) \ldots (1 - \alpha_{n-1})$ is equal to -

(a) n - 1 (b) n (c) -1 (d) 1 ans b

2. If z is a nonreal root of $\sqrt[7]{-1}$ then $z^{86} + z^{175} + z^{289}$ is equal to-

(a) 0 (b) -1 (c) 3 (d) 1 ans b

3. If α, β, γ are the roots of equation $x^3 - 3x^2 + 3x + 7 = 0$ and ω is cube roots of unity then the value of $\frac{\alpha-1}{\beta-1} + \frac{\beta-1}{\gamma-1} + \frac{\gamma-1}{\alpha-1}$ is-

(a) ω^2 (b) $2\omega^2$ (c) $3\omega^2$ (d) $-3\omega^2$ ans c

4. If $\alpha = \cos\frac{2\pi}{7} + i\sin\frac{2\pi}{7}$ and $p = \alpha + \alpha^2 + \alpha^4$, $q = \alpha^3 + \alpha^5 + \alpha^6$ then the equation whose roots are p and q -

(a) $x^2 + x + 4 = 0$ (b) $x^2 + x + 2 = 0$

(c) $x^2 + x - 2 = 0$ (d) $x^2 + x - 4 = 0$ ans b

5. If $x = \omega - \omega^2 - 2$, then the value of $x^4 + 3x^3 + 2x^2 - 11x - 6$ is

(a) 1 (b) -1 (c) 2 (d) None of these ans a

6. If $3^{49}(x + iy) = \left(\frac{3}{2} + \frac{\sqrt{3}}{2}i\right)^{100}$ and $x = ky$, then k is -

(a) $-\frac{1}{3}$ (b) $\sqrt{3}$ (c) $-\sqrt{3}$ (d) $-\frac{1}{\sqrt{3}}$ ans d

7. The value of $\left(\frac{1+i\sqrt{3}}{1-i\sqrt{3}}\right)^6 + \left(\frac{1-i\sqrt{3}}{1+i\sqrt{3}}\right)^6$ is -

(a) 2 (b) -2 (c) 1 (d) 0 ans a

8. If ω is a cuberoot of unity then $(1 + \omega - \omega^2)^7$ is equal to

(a) 128ω (b) -128ω (c) $128\omega^2$ (d) $-128\omega^2$ ans d

9. If ω is a complex cube root of unity, then the value of

$$\frac{a + b\omega + c\omega^2}{c + a\omega + b\omega^2} + \frac{a + b\omega + c\omega^2}{b + c\omega + a\omega^2}$$ is

(a) 1 (b) 0 (c) 2 (d) – 1 ans d

10. If $z + z^{-1} = 1$, then $z^{50} + z^{-50}$ is equal to - ans b

(a) 1 (b) - 1 (c) 0 (d) 2

11. If ω is a cube root of unity, then ans c

$(3 + 5\omega + 3\omega^2)^2 + (3 + 3\omega + 5\omega^2)^2$ is equal to -

(a) 4 (b) 0 (c) - 4 (d) None of these

12. The common roots of the equation ans c

$z^3 + 2z^2 + 2z + 1 = 0$ and $z^{1985} + z^{100} + 1 = 0$ are -

(a) - 1 ,ω (b) - 1 , ω^2 (c) ω, ω^2 (d) ω, - ω^2

13. If ω is a cube root of unity, then the value of $(1 + \omega - \omega^2)$. Ans d

$(1 - \omega + \omega^2)$ is

(a) 1 (b) 0 (c) 2 (d) 4

14. If the cube roots of unity are 1, ω, ω^2, then the roots of the equation $(x - 1)^3 + 8 = 0$ are

(a) - 1, 1 + 2ω, 1 + 2ω^2 (b) -1, 1 - 2ω, 1 - 2ω^2 ANS b

(c) -1, -1, -1 (d) None of these

15. If ω is a complex cube root of unity, then value of expression

$$\cos\left[\left\{(1-\omega)(1-\omega)^2+.....+(10-\omega)(10-\omega^2)\right\}\frac{\pi}{900}\right]$$ ans b

(a) -1 (b) 0 (c) 1 (d) $\frac{\sqrt{3}}{2}$

16. If α is a complex number such that $\alpha^2 + \alpha + 1 = 0$, then α^{31} is equal to

(a) α (b) α^2 (c) 0 (d) 1 ans a

17. The value of $\sum_{k=1}^{6}\left(\sin\frac{2\pi k}{7} - i\cos\frac{2\pi k}{7}\right)$ is - ans c

(a) 0 (b) - 1 (c) I (d) - i