



JAYAM TUITION CENTRE.

VETTAVALAM. TIRUVANNAMALAI-DT.

STD: 12
SUB: MATHS
MARKS: 25

EXERCISE TEST -6 (EX:2-8)

2 Mark Questions

5 X 2 = 10

1. Simplify $\left(\sin \frac{\pi}{6} + i \cos \frac{\pi}{6}\right)^{18}$.

2. Simplify $\left(\frac{1+\cos 2\theta+i \sin 2\theta}{1+\cos 2\theta-i \sin 2\theta}\right)^{30}$.

3. Find the cube roots of unity.

4. Find the fourth roots of unity.

5. Find all cube roots of $\sqrt{3} + i$.

5 Mark Questions

3 X 5 = 15

6. Solve the equation $z^3 + 8i = 0$, where $z \in \mathbb{C}$.

7. If $z = (\cos \theta + i \sin \theta)$, show that

$$z^n + \frac{1}{z^n} = 2 \cos n \theta \text{ and } z^n - \frac{1}{z^n} = 2i \sin n \theta.$$

8. If $2 \cos \alpha = x + \frac{1}{x}$ and $2 \cos \beta = y + \frac{1}{y}$, show that

$$\frac{x^m}{y^n} - \frac{y^n}{x^m} = 2i \sin(m\alpha - n\beta)$$