XI - TEST NO: 6

→ CHAPTER: COMPLEX NUMBERS

- Total Qns = 25
- 2 Marks each
- Max Marks = 50
- Max Time = 1:45 (1 hr 45 min)

Qns: 1 → A real value of x satisfies the equation

$$\left(\frac{3-4ix}{3+4ix}\right) = \alpha - i\beta \text{, if } \alpha^2+\beta^2 =$$

(A) −1 (B) 1 (C) 2 (D) −2

Qn: 2 → If $z = x+iy$ lies in the 3^{rd} quadrant, then $\frac{\bar{z}}{z}$ also lies in the third quadrant if

(A) $x > y > 0$ (B) $x < y < 0$ (C) $y < x < 0$ (D) $y > x > 0$

Qns 3 → The real values of α for which the expression ~~1+2isinα~~ $\frac{1-i\sin\alpha}{1+2i\sin\alpha}$ is purely real is

(A) $(n+1)\frac{\pi}{2}$ (B) $(2n+1)\frac{\pi}{2}$ (C) $n\pi$ (D) none of these

Qns: 4 → $\sum_{n=1}^{13}\left(i^n + i^{n+1}\right)$ equals to ; when $n \in Z$

(A) $1-i$ (B) $-1-i$ (C) $-1+i$ (D) $1+i$

Qns. 5 → The equation $|z+1-i| = |z-1+i|$ represents a

(A) circle (B) parabola (C) ellipse (D) straight line

Qn 6 → Value of $\frac{i^{4n+1} - i^{4n-1}}{2}$ is

(A) 1 (B) −1 (C) $-i$ (D) i

Scanned with CamScanner

Ques: 7 → If $z = \frac{11-3i}{1+i}$. If α is a real number such that $|z - i\alpha| = 4$, then the value of α is

(A) -7 (B) 7 (C) 4 (D) -4

Ques: 8 → The number of solutions of the equation $|z|^2 + 7\bar{z} = 0$ is

(A) 2 (B) 1 (C) 3 (D) Infinite many solution

Ques. 9 → Value of $(-\sqrt{-1})^{4n+3}$ is ; $n \in N$

(A) 1 (B) i (C) $-i$ (D) -1

Ques. 10 → The value of $x^3 + 7x^2 - x + 16$ when $x = 1+2i$ is

(A) $17-24i$ (B) $-17+24i$ (C) $-17-24i$ (D) none of these

Ques. 11 → If $z(2-i) = 3+i$, then z^{20} is equal to

(A) -2^{10} (B) 2^{10} (C) 2^{20} (D) -2^{20}

Ques. 12 → If $|z^2 - 1| = |z|^2 + 1$, then z lies on

(A) Imaginary Axis (B) Origin (C) Real Axis (D) none of these

Ques. 13 → The conjugate of $\frac{\sqrt{5+12i} + \sqrt{5-12i}}{\sqrt{5+12i} - \sqrt{5-12i}}$ is

(A) $-3i$ (B) $\frac{3}{2}i$ (C) $-\frac{3}{2}i$ (D) $\frac{3}{2}i$

Qu. 21 → If $(\sqrt{5}+\sqrt{3}i)^{33} = 2^{49} z$, then modulus of Complex number z is equal to

(A) 1 (B) $\sqrt{2}$ (C) $2\sqrt{2}$ (D) 4

Qu. 22 → If $|1-\bar{z}_1 z_2|^2 - |z_1 - z_2|^2 = k(1-|z_1|^2)(1-|z_2|^2)$ then k is equal to

(A) 1 (B) 2 (C) $\frac{1}{2}$ (D) $\frac{1}{\sqrt{2}}$

Qu. 23 → The real value of 'a' for which $3i^3 - 2ai^2 + (1-a)i + 5$ is real is

(A) 2 (B) 3 (C) −2 (D) 1

Qu. 24 → If $\frac{(a^2+1)^2}{2a-i} = x - iy$, then value of x^2+y^2 is

(A) $\frac{(a^2+1)^2}{4a^2+1}$ (B) $\frac{(a^2+1)^4}{(2a+i)^2}$ (C) $\frac{(a^2+1)^4}{4a^2+1}$ (D) $\frac{(a^2+1)^4}{4a^2-1}$

Qu. 25 → If $z = 1+2i$

find $\left|\frac{7-z}{1-z^2}\right|$

(A) $|z|$ (B) $2|z|$ (C) $|z|^2$ (D) $\frac{|z|}{2}$

— x —

Qn. 14 → Value of $(1+i)^4\left(1+\frac{1}{i}\right)^4$ is

(A) 8 (B) 16 (C) 32 (D) 2

Qn. 15 → The real values of x and y for which the following equality hold, are respectively

(A) 1, 3 or −1, 1/3 (B) 2, 1/3 or −2, 3 (C) 2, 3 or −2, 1/3
(D) none of these

Qn. 16 → If $|z+1| = z+2+2i$, then z equals to

(A) $2+\sqrt{3}i$ (B) $\frac{1}{2}+2i$ (C) $\frac{1}{2}-2i$ (D) $\frac{\sqrt{3}}{2} \pm \frac{1}{2}i$

Qn. 17 → Number of solutions of the equation $z^2+|z|^2=0$ is

(A) 1 (B) 2 (C) Infinitely many (D) 3

Qn. 18 → Number of non-zero Integral solutions of the equation $|1-i|^x = 2^x$ is

(A) 1 (B) 2 (C) Infinite many (D) none of these

Qn. 19 → Modulus of $\frac{1+i}{1-i} - \frac{1-i}{1+i}$ is

(A) 2 (B) 4 (C) 1 (D) 8

Qn. 20 → The modulus of the complex number

$$z = \frac{(1-i\sqrt{3})(\cos\theta + i\sin\theta)}{2(1-i)(\cos\theta - i\sin\theta)}$$ is

(A) $\frac{1}{\sqrt{2}}$ (B) $2\sqrt{3}$ (C) $\sqrt{2}$ (D) $\frac{1}{2\sqrt{2}}$

Qn. 21 → If $(\sqrt{5} + \sqrt{3}i)^{33} = 2^{49} z$, then modulus of complex number z is equal to

(A) 1 (B) $\sqrt{2}$ (C) $2\sqrt{2}$ (D) 4

Qn. 22 → If $|1-\bar{z}_1 z_2|^2 - |z_1 - z_2|^2 = k(1-|z_1|^2)(1-|z_2|^2)$ then k is equal to

(A) 1 (B) 2 (C) $\frac{1}{2}$ (D) $\frac{1}{\sqrt{2}}$

Qn. 23 → The real value of 'a' for which $3i^3 - 2ai^2 + (1-a)i + 5$ is real is

(A) 2 (B) 3 (C) −2 (D) 1

Qn. 24 → If $\frac{(a^2+1)^2}{2a-i} = x - iy$, then value of x^2+y^2 is

(A) $\frac{(a^2+1)^2}{4a^2+1}$ (B) $\frac{(a^2+1)^4}{(2a+i)^2}$ (C) $\frac{(a^2+1)^4}{4a^2+1}$ (D) $\frac{(a^2+1)^4}{4a^2-1}$

Qn. 25 → If $z = 1+2i$

find $\left|\frac{7-z}{1-z^2}\right|$

(A) $|z|$ (B) $2|z|$ (C) $|z|^2$ (D) $\frac{|z|}{2}$

— x —