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Assignment-1 Chapter-2 Complex Number

AI24BTECH11029- Rudrax Garwa

SECTION-B JEE MAIN / AIEEE

a) $\beta \in (-1,0)$ b) $|\beta| = 1$

14) If $z^2+z+1=0$, where z is an imaginary number, then the value of $ (z+\frac{1}{z})^2+\left(z^2+\frac{1}{z^2}\right)^2+\left(z^3+\frac{1}{z^3}\right)^2+\ldots+\left(z^6+\frac{1}{z^6}\right)^2 20) \text{ If } \omega(\neq 1) \text{ is the cube root of unity, and } (1+\omega)^7=A+B\omega\text{ .Then } (A,B) \text{ equals }: [2011] $ is $ [2006] $ a) 18 b) 54 c) 6 d) 12 $ (1,1) $ b) $(1,0) $ c) $(-1,1)$ d) $(0,1)$ 21) If $z+4 \leq 3$, then the maximum value of $ z+1 $ is $ [2007] $ a) 6 b) 0 c) 4 d) 10 $ (1,0) $ c) $(-1,1)$ d) $(0,1)$ 21) If $z+4 \leq 3$, then the maximum value of $ z+1 $ is $ [2007] $ a) either on the real axis or on a circle not passing through the origin b) on a circle with centre at the origin c) either on the real axis or on a circle not passing through the origin d) on imaginary axis $ (1,1) $ by $(1,0) $ c) $(-1,1) $ d) $(0,1) $ 22) If $z = 1$ and $z = 1$ and $z = 1$ is real, thenthe point represented by the complex number $z = 1$ is: $ [2012] $ a) either on the real axis or on a circle not passing through the origin d) on imaginary axis $ (1,1) $ b) $(1,0) $ 22) If $z = 1$ and $z = 1$
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b) Both S and T are equivalence relation on R a) is strictly greater than $\frac{5}{2}$
c) S is an equivalence relation on R but T is not d) T is an equivalence relation on R but S is not c) is strictly greater than $\frac{3}{2}$ but less than $\frac{5}{2}$ c) is equal to $\frac{5}{2}$
18) The number of complex numbers z such that d) lies in the interval (1,2)
z-1 = z+1 = z-i equals [2010] 24) A complex number z is said to be unimodular
a) 1 b) 2 c) ∞ d) 0 if $ z = 1$. Suppose $z_1 and z_2$ are complex numbers such that $\frac{z_1 - 2z_2}{z_1 \overline{z_2}}$ is unimodular and z_2 is not unimodular. Then the point z_1 lies on z_2
19) Let α, β be real and z be a complex number. If $z^2 + z\alpha + \beta = 0$ has two distinct roots on the
If $z^2 + z\alpha + \beta = 0$ has two distinct roots on the line $Rez = 1$, then it is necessary that: [2011]
b) circle of radius $\sqrt{2}$ c) straight line parallel to x-axis

- d) straight line parallel to y-axis
- 25) A value of θ for which $\frac{2+3i\sin\theta}{1-2i\sin\theta}$ is purely imaginary is: M2016]
 - a) $sin^{-1}\left(\frac{\sqrt{3}}{4}\right)$ b) $sin^{-1}\left(\frac{1}{\sqrt{3}}\right)$

c) $\frac{\pi}{3}$

- d) $\frac{\pi}{6}$
- 26) Let $\{A = \theta \in \left(\frac{\pi}{2}, \pi\right) : \frac{3+2i\sin\theta}{1-2i\sin\theta} \text{ is purely } \}$ imaginary. Then the sum of element in A is: [JEE M 2019-9 Jan (M)]
- a) $\frac{5\pi}{6}$ b) π c) $\frac{3\pi}{4}$ d) $\frac{2\pi}{3}$
- 27) let α and β be two roots of the equation x^2 + 2x + 2 = 0, then $\alpha^{15} + \beta^{15}$ is equal to : [JEE M 2019-Jan (M)]
 - a) -256
- b) 512
 - c) -512 d) 256
- 28) All the points in the set ($S = \left\{\frac{\alpha i}{\alpha + i} : \alpha \in R\right\}$ [JEE M 2019-9 April (M)]
 - a) straight line whose slope is 1
 - b) circle whose radius is 1
 - c) circle whose radius is $\sqrt{2}$
 - d) straight line whose slope is -1