Remark

Assignment-1
Chapter-2
Complex Number

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Section-B JEE MAIN / AIEEE

14) If $z^2 + z + 1 = 0$,where z is an imaginary number, then the value of $\left(z + \frac{1}{z}\right)^2 + \left(z^2 + \frac{1}{z^2}\right)^2 + \left(z^3 + \frac{1}{z^3}\right)^2 + ... + \left(z^6 + \frac{1}{z^6}\right)^2$ is [2006]

    a) 18 b) 54 c) 6 d) 12

15) If $|z+4| \leq 3$, then the maximum value of $|z+1|$ is [2007]

    a) 6 b) 0 c) 4 d) 10

16) The conjugate of a complex is $\frac{1}{i-1}$ then that complex number is [2008]

    a) $\frac{-1}{i-1}$ b) $\frac{1}{i+1}$ c) $\frac{-1}{i+1}$ d) $\frac{1}{i-1}$

17) Let R be the real line.Consider the following subset
s of the real plane:
S={(x,y):y=x+1 and 0<x<2}
T={(x,y):x-y is an integer},
Which one of the following is true ? [2008]

    a) Neither S nor T is an R equivalence relation on
    b) Both S and T are equiv- alence relation on R
    c) S is an equivalence relation on R but T is not
    d) T is an equivalence relation on R but S is not

18) The number of complex numbers z such that $|z - 1| = |z + 1| = |z - i|$ equals [2010]

    a) 1 b) 2 c) ∞ d) 0

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 line $Rez = 1$,then it is necessary that: [2011]

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

20) If $\omega(\neq 1)$ is the cube root of unity, and $(1 + \omega)^7 = A + B\omega$ .Then (A, B) equals : [2011]

    a) $(1, 1)$ b) $(1, 0)$
    c) $(-1, 1)$ d) $(0, 1)$

21) If $z \neq 1 and \frac{z^2}{z-1}$ is real,thenthe point represented by the complex number z lies: [2012]

    a) either on the real axis or on a circle not pass- ing through the origin
    b) on a circle with centre at the origin
    c) either on the real axis or on a circle not pass- ing through the origin
    d) on imaginary axis

22) If z is a complex number of unit modulus and arguement θ,then the $arg\left(\frac{1+z}{1+\bar{z}}\right)$ equals: [JEE M 2013]

    a) $-\theta$ b) $\frac{\pi}{2} - \theta$ c) θ d) $\pi - \theta$

23) If z is a complex number such that $|z| \geq 2$,then the minimum value of $|z + \frac{1}{2}|$: [JEE M 2014]

a) is strictly greater than $\frac{5}{2}$

b) is strictly greater than $\frac{3}{2}$ but less than $\frac{5}{2}$

c) is equal to $\frac{5}{2}$

d) lies in the interval $(1,2)$

24) A complex number z is said to be unimodular if$|z| = 1$. Suppose $z_1 and z_2$ are complex numbers such that $\frac{z_1-2z_2}{2-z_1\overline{z_2}}$ is unimodular and z_2 is not unimodular. Then the point z_1 lies on a: [JEE M 2016]

a) circle of radius 2

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 $\frac{2+3isin\theta}{1-2isin\theta}$ is purely imaginary is : [JEE 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 $A = \{\theta \in \left(\frac{\pi}{2},\pi\right) : \frac{3+2isin\theta}{1-2isin\theta}$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 $S = \left(\{\frac{\alpha+i}{\alpha-i} : \alpha \in R\}\right)$ $(i = \sqrt{-1})$ lie on a: [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