RAVI MATHS TUITION CENTER PH - 8056206308

REIVISION TEST 2 [CHAPTER 2 & 3]

Date : 26-Jun-19

12th Standard 2019 EM

Maths

Reg.No. : | | | | | | |

Time : 02:30:00 Hrs

Total Marks : 90

20 x 1 = 20

1) The area of the triangle formed by the complex numbers z,iz, and z+iz in the Argand's diagram is

(a) $\frac{1}{2}|z|^2$ (b) $|z|^2$ (c) $\frac{3}{2}|z|^2$ (d) $2|z|^2$

2) If z is a non zero complex number, such that $2iz^2=\bar{z}$ then |z|is then |z| is

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

3) If $\left|z-\frac{3}{z}\right|=2$ then the least value |z| is

(a) 1 (b) 2 (c) 3 (d) 5

4) The solution of the equation |z|-z=1+2i is

(a) $\frac{3}{2}-2i$ (b) $-\frac{3}{2}+2i$ (c) $2-\frac{3}{2}i$ (d) $2+\frac{3}{2}i$

5) z_1,z_3 and z_3 are complex number such that z1+z2+z3=0 and $|z_1|=|z_2|=|z_3|=1$ then $z_1^2+z_2^2+z_2^3$ is

(a) 3 (b) 2 (c) 1 (d) 0

6) If z=cos$\frac{\pi}{4}$ +i sin$\frac{\pi}{6}$, then

(a) |z| =1, arg(z) =$\frac{\pi}{4}$ (b) |z| =1, arg(z) =$\frac{\pi}{6}$ (c) |z|=$\frac{\sqrt{3}}{2}$, arg(z)=$\frac{5\pi}{24}$ (d) |z| =$\frac{\sqrt{3}}{2}$, arg (z) =$\tan^{-1}\left(\frac{1}{\sqrt{2}}\right)$

7) The least positive integer n such that $\left(\frac{2i}{1+i}\right)^n$ is a positive integer is

(a) 16 (b) 8 (c) 4 (d) 2

8) If z=1-cosθ + i sinθ, then |z| =

(a) 2 sin$\frac{1}{3}$ (b) 2 cos$\frac{\theta}{2}$ (c) 2|sin$\frac{\theta}{2}$ | (d) 2|cos$\frac{\theta}{2}$ |

9) If x+iy =$\frac{3+5i}{7-6i}$, they y =

(a) $\frac{9}{85}$ (b) -$\frac{9}{85}$ (c) $\frac{53}{85}$ (d) none of these

10) If ω is the cube root of unity, then the value of $(1-\omega)(1-\omega^2)(1-\omega^4)(1-\omega^8)$ is

(a) 9 (b) -9 (c) 16 (d) 32

11) The modular of $\frac{(-1+i)(1-i)}{1+i\sqrt{3}}$ is ______

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

12) A polynomial equation in x of degree n always has

(a) n distinct roots (b) n real roots (c) n imaginary roots (d) at most one root

13) If α,β and γ are the roots of x^3+px^2+qx+r, then $\Sigma\frac{1}{\alpha}$ is

(a) -$\frac{q}{r}$ (b) $\frac{p}{r}$ (c) $\frac{q}{r}$ (d) -$\frac{q}{p}$

14) According to the rational root theorem, which number is not possible rational root of $4x^7+2x^4-10x^3-5$?

(a) -1 (b) $\frac{5}{4}$ (c) $\frac{4}{5}$ (d) 5

15) The number of real numbers in [0,2π] satisfying $\sin^4x-2\sin^2x+1$ is

(a) 2 (b) 4 (c) 1 (d) °

16) The polynomial x^3+2x+3 has

(a) one negative and two real roots (b) one positive and two imaginary roots (c) three real roots (d) no solution

17) The number of positive roots of the polynomial $\sum_{j=0}^{n} n_{C_r}$ $(-1)^r x^r$ is

(a) 0 (b) n (c) < n (d) r

18) Ifj(x) = 0 has n roots, thenf'(x) = 0 has __________ roots

(a) n (b) n -1 (c) n+1 (d) (n-r)

19) If (2+Ã3)x^2-2x+1+(2-Ã3)x^2-2x-1=$\frac{2}{2-\sqrt{3}}$ then x=

(a) 0,2 (b) 0,1 (c) 0,3 (d) 0, Ã3

20) If p(x) = $ax^2 + bx + c$ and Q(x) = $-ax^2 + dx + c$ where ac - 0 then p(x). Q(x) = 0 has at least _______ real roots.

(a) no (b) 1 (c) 2 (d) infinite

7 x 2 = 14

21) Given the complex number z=2+3i, represent the complex numbers in Argand diagram

z, iz , and z+iz

22) If z_i z_i =1−3i, = −4 , and z_3 = 5 , show that $(z_1+z_2)+z_3=z_1+(z_2+z_3)$

23) Find the modulus of the following complex number

$$\frac{2-i}{1+i}+\frac{1-2i}{1-i}$$

24) Obtain the Cartesian form of the locus of z=x+iy in each of the following cases

Im[(1−i)z+1]= 0

25) Show that the following equations represent a circle, and, find its centre and radius

|3x-6+12i|=8

26) Find a polynomial equation of minimum degree with rational coefficients, having $\sqrt{5}-\sqrt{3}$ as a root.

27) Solve: (2x-1)(x+3)(x-2)(2x+3)+20=0

28) Find all zeros of the polynomial $x^6-3x^5-5x^4+22x^3-39x^2-39x+135$, if it is known that 1+2i and $\sqrt{3}$ are two of its zeros.

29) Find all real numbers satisfying $4^x-3(2^{x+2})+2^5=0$

30) Examine for the rational roots of $x^8-3x+1=0$

7 x 3 = 21

31) Show that |z+2−i|< 2 represents interior points of a circle. Find its centre and radius.

32) Find the fourth roots of unity.

33) Simplify the following:

$i\, i^2 i^3 \ldots i^{40}$

34) Obtain the Cartesian form of the locus of z in the cases.

|2z-3-i|=3

35) Find the locus of z if Re$\left(\frac{z+1}{z-i}\right)$ =0 where z=x+iy.

36) If p is real, discuss the nature of the roots of the equation $4x^2+4px+p+2=0$ in terms of p.

37) Solve the equation $2x^3+11x^2-9x-18=0$.

38) If the roots of $x^3+px^2+qx+r=0$ are in H.P. prove that 9pqr = $27r^3+2p$.

39) Solve the equation $x^3-5x^2-4x+20=0$

40) Find solution, if any, of the equation $2\cos^2x-9\cos x+4=0$

14 x 5 = 70

41) a)

Find the value of the real numbers x and y, if the complex number (2+i)x+(1−i)y+2i −3 and x+(−1+2i)y+1+iare equal

(OR)

b) Let z_1,z_2, and z_3 be complex numbers such that $\lfloor z_1 \rfloor = |z_2| = |z_3| = r > 0$ and $z_1+z_2+z_3 \neq$ 0 prove that

$\left|\frac{z_1z_2+z_2z_3+z_3z_2}{z_1+z_2+z_3}\right|$ =r

42) a) If z=x+iy and arg$\left(\frac{z-1}{z+1}\right) = \frac{\pi}{2}$,then show that $x^2+y^2=1$.

(OR)

b) If 1, ω, ω^2 are the cube roots of unity then show that $(1+5\omega^2+\omega^4)(1+5\omega+\omega^2)(5+\omega+\omega^5)=64$

43) a) Find all the roots $(2-2i)^{\frac{1}{3}}$ and also find the product of its roots.

(OR)

b) Show that, if p,q,r are rational, the roots of the equation $x^2-2px+p^2-q^2+2qr-r^2=0$ are rational.

44) a) Discuss the nature of the roots of the following polynomials:

$x^{2018}+1947x^{1950}+15x^8+26x^6+2019$

(OR)

b) If a, b, c, d and p are distinct non-zero real numbers such that $(a^2+b^2+c^2)p^2-2(ab+bc+cd)p+(b^2+c^2+d^2) \leq 0$ the n. Prove that a,b,c,d are in G.P and ad=bc

45) a) Find the product $\frac{3}{2}\left(cos\frac{\pi}{3}+isin\frac{\pi}{3}\right).6\left(cos\frac{5\pi}{6}+isin\frac{5\pi}{6}\right)$ in rectangular from

(OR)

b) Represent the complex numbe $1+i\sqrt{3}$ in polar form.

46) a) Show that the equation $2x^2-6x+7=0$ cannot be satisfied by any real values of x.

(OR)

b) Solve the equation (x-2)(x-7)(x-3)(x+2)+19=0

47) a) Find the principal argument Arg z , when z = $\frac{-2}{1+i\sqrt{3}}$

(OR)

b) Show that the polynomial $9x^9+2x^5-x^4-7x^2+2$ has at least six imaginary roots.

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