QB365 Question Bank Software Study Materials

Complex Numbers 50 Important 1Marks Questions With Answers (Book Back and Creative)

12th Standard

Maths

Total Marks : 50

50 x 1 = 50

1) $i^n+i^{n+1}+i^{n+2}+i^{n+3}$ is

(a) 0 (b) 1 (c) -1 (d) i

2) The value of $\sum_{n=1}^{13}\left(i^n+i^{n-1}\right)$ is

(a) 1+ i (b) i (c) 1 (d) 0

3) 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) $2|z|^2$

4) The conjugate of a complex number is $\frac{1}{i-2}$. Then the complex number is

(a) $\frac{1}{i+2}$ **(b) $\frac{-1}{i+2}$** (c) $\frac{-1}{i-2}$ (d) $\frac{1}{i-2}$

5) If $z=\frac{(\sqrt{3}+i)^3(3i+4)^2}{(8+6i)^2}$, then $|z|$ is equal to

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

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

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

7) If $|z - 2 + i| \leq 2$, then the greatest value of $|z|$ is

(a) $\sqrt{3}-2$ (b) $\sqrt{3}+2$ (c) $\sqrt{5}-2$ **(d) $\sqrt{5}+2$**

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

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

9) If $|z| = 1$, then the value of $\frac{1+z}{1+\bar{z}}$ is

(a) z (b) $\bar{z}$ (c) $\frac{1}{z}$ (d) 1

10) 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) $2+\frac{3}{2}i$

11) If $|z_1| = 1$, $|z_2| = 2$, $|z_3| = 3$ and $|9z_1z_2 + 4z_1z_3 + z_2z_3| = 12$, then the value of $|z_1+z_2+z_3|$ is

(a) 1 **(b) 2** (c) 3 (d) 4

12) If z is a complex number such that $z\in\mathbb{C}\backslash\mathbb{R}$ and $z+\frac{1}{z}\epsilon R$, then $|z|$ is

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

13) z_1, z_2 and z_3 are complex number such that $z_1 + z_2 + z_3 = 0$ and $|z_1| = |z_2| = |z_3| = 1$ then $z_1{}^2 + z_2{}^2 + z_3{}^3$ is

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

14) If $\frac{z-1}{z+1}$ is purely imaginary, then |z| is

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

15) If z = x + iy is a complex number such that |z+2| = |z−2|, then the locus of z is

(a) real axis **(b) imaginary axis** (c) ellipse (d) circle

16) The principal argument of $\frac{3}{-1+i}$ is

(a) $\frac{-5\pi}{6}$ (b) $\frac{-2\pi}{3}$ **(c)** $\frac{-3\pi}{4}$ (d) $\frac{-\pi}{2}$

17) The principal argument of $(\sin 40°+i \cos 40°)^5$ is

(a) −110° (b) −70° (c) 70° (d) 110°

18) If (1+i)(1+2i)(1+3i)...(1+ni) = x + iy, then $2 \cdot 5 \cdot 10 \ldots \left(1+n^2\right)$ is

(a) 1 (b) i **(c)** x^2+y^2 (d) $1+n^2$

19) If $\omega \neq 1$ is a cubic root of unity and $(1+\omega)^7 = A + B\omega$, then (A, B) equals

(a) (1, 0) (b) (−1, 1) (c) (0, 1) **(d) (1, 1)**

20) The principal argument of the complex number $\frac{(1+i\sqrt{3})^2}{4i(1-i\sqrt{3})}$ is

(a) $\frac{2\pi}{3}$ (b) $\frac{\pi}{6}$ (c) $\frac{5\pi}{6}$ **(d)** $\frac{\pi}{2}$

21) If α and β are the roots of $x^2+x+1 = 0$, then $\alpha^{2020} + \beta^{2020}$ is

(a) -2 **(b) -1** (c) 1 (d) 2

22) The product of all four values of $\left(cos\frac{\pi}{3} + isin\frac{\pi}{3}\right)^{\frac{3}{4}}$ is

(a) -2 (b) -1 **(c) 1** (d) 2

23) If $\omega \neq 1$ is a cubic root of unity and $\begin{vmatrix} 1 & 1 & 1 \\ 1 & -\omega^2-1 & \omega^2 \\ 1 & \omega^2 & \omega^7 \end{vmatrix}$ = 3k, then k is equal to

(a) 1 (b) -1 (c) $\sqrt{3i}$ **(d)** $-\sqrt{3i}$

24) The value of $\left(\frac{1+\sqrt{3i}}{1-\sqrt{3i}}\right)^{10}$ is

(a) $cis\frac{2\pi}{3}$ (b) $cis\frac{4\pi}{3}$ (c) $-cis\frac{2\pi}{3}$ (d) $-cis\frac{4\pi}{3}$

25) If $\omega = cis\frac{2\pi}{3}$, then the number of distinct roots of $\begin{vmatrix} z+1 & \omega & \omega^2 \\ \omega & z+\omega^2 & 1 \\ \omega^2 & 1 & z+\omega \end{vmatrix}$=0

(a) 1 (b) 2 (c) 3 (d) 4

26) If $\sqrt{a+ib}$ = x + iy, then possible value of $\sqrt{a-ib}$ is __________

(a) x^2+y^2 (b) $\sqrt{x^2+y^2}$ (c) x+iy **(d) x-iy**

27) If, i^2 = -1, then $i^1 + i^2 + i^3 + \ldots$.+ up to 1000 terms is equal to _______

(a) 1 (b) -1 (c) i **(d) 0**

28) 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) $|z| = \frac{\sqrt{3}}{2}, \arg(z) = \tan^{-1}\left(\frac{1}{\sqrt{2}}\right)$**

29) 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

30) If $z = \frac{1}{1-cos\theta-isin\theta}$, the Re(z) = __________

(a) 0 **(b) $\frac{1}{2}$** (c) $\cot\frac{\theta}{2}$ (d) $\frac{1}{2}\cot\frac{\theta}{2}$

31) The complex number z which satisfies the condition $\left|\frac{1+z}{1-z}\right| = 1$ lies on ________

(a) circle $x^2 + y^2 = 1$ **(b) x-axis** (c) y-axis (d) the lines x+y = 1

32) If z = a + ib lies in quadrant then $\frac{\bar{z}}{z}$ also lies in the III quadrant if ________

(a) a > b > 0 (b) a < b < 0 **(c) b < a < 0** (d) b > a > 0

33) $\frac{1+e^{-i\theta}}{1+e^{i\theta}}$ = __________

(a) cosθ + i sinθ **(b) cosθ - i sinθ** (c) sinθ - i cosθ (d) sinθ + icosθ

34) If $z^n = cos\frac{n\pi}{3} + isin\frac{n\pi}{3}$, then $z_1, z_2 \ldots z_6$ is ________

(a) 1 **(b) -1** (c) i (d) -i

35) If x = cosθ + i sinθ, then the value of $x^n + \frac{1}{x^n}$ is __________

(a) 2 cosθ (b) 2i sin nθ (c) 2i sin nθ (d) 2i cos nθ

36) $\frac{(cos\theta+isin\theta)^6}{(cos\theta-isin\theta)^5}$ = ________

(a) cos 11θ - isin 11θ **(b) cos 11θ + isin 11θ** (c) cosθ + i sinθ (d) $cos\frac{6\theta}{5} + isin\frac{6\theta}{5}$

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

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

38) The value of $\frac{(cos45^0+isin45^0)^2(cos30^0-isin30^0)}{cos30^0+isin30^0}$ is __________

(a) $\frac{1}{2} + i\frac{\sqrt{3}}{2}$ (b) $\frac{1}{2} - i\frac{\sqrt{3}}{2}$ (c) $-\frac{\sqrt{3}}{2} + \frac{1}{2}$ **(d) $\frac{\sqrt{3}}{2} + \frac{1}{2}$**

39) If x = cos θ + i sin θ, then $x^n + \frac{1}{x^n}$ is ______

(a) 2 cos nθ (b) 2 i sin nθ (c) 2^n cosθ (d) 2^n i sinθ

40) If z_1, z_2, z_3 are the vertices of a parallelogram, then the fourth vertex z_4 opposite to z_2 is _____

(a) $z_1 + z_2 - z_2$ (b) $z_1 + z_2 - z_3$ (c) $z_1 + z_2 - z_3$ (d) $z_1 - z_2 - z_3$

41) If $x_r = cos\left(\frac{\pi}{2^r}\right) + isin\left(\frac{\pi}{2^r}\right)$ then $x_1, x_2, x_3 \ldots x_\infty$ is ________

(a) -∞ (b) -2 **(c) -1** (d) 0

42) If $z = \frac{4+3i}{5-3i}$ then z^{-1} = __________

(a) $\frac{11}{25} - \frac{27}{25}i$ (b) $\frac{-11}{25} - \frac{27}{25}i$ (c) $\frac{-11}{25} + \frac{27}{25}i$ (d) $\frac{11}{25} + \frac{27}{25}i$

43) If the cube roots of unity are 1, ω, ω^2 then $1 + \omega + \omega^2$ = ______________

(a) 1 **(b) 0** (c) -1 (d) ω

44) Let z, w be complex numbers such that $\bar{z} + i\bar{w} = 0$ and $\arg(\mathbf{zw}) = \pi$ then arg z = _____________

(a) $\frac{3\pi}{4}$ (b) $\frac{\pi}{2}$ (c) $\frac{\pi}{4}$ (d) $\frac{5\pi}{4}$

45) If $\frac{(1+i)x-2i}{3+i} + \frac{(2-3i)\cdot y+i}{3-i} = i$ then (x, y) = _____________

(a) (3, 1) **(b) (3, -1)** (c) (-3, 1) (d) (- 3, - 1)

46) Let z be complex number with modulus 2 and argument $\frac{-2\pi}{3}$ then $z =$ ________

(a) $-1 + i\sqrt{3}$ (b) $\frac{-1+i\sqrt{3}}{2}$ **(c)** $-1 - i\sqrt{3}$ (d) $\frac{-1-i\sqrt{3}}{2}$

47) The equation | z - i | + | z + i | = k represents an ellipse if k = ___________

(a) 1 (b) 2 **(c) 4** (d) -1

48) If $\begin{vmatrix} 6i & -3i & 1 \\ 4 & 3i & -1 \\ 20 & 3 & i \end{vmatrix} = x +$ iy then _________

(a) x = 3, y = 1 (b) x = 1, y = 3 (c) x = 0, y = 3 **(d) x = 0, y = 0**

49) If $= \cos\frac{\pi}{3} - i\sin\frac{\pi}{3}$ then $z^2 - z + 1 =$ ________

(a) - 2i (b) 2 **(c) 0** (d) -2

50) All complex numbers z which satisfy the equation $\left|\frac{z-6i}{z+6i}\right| = 1$ lie on the ________

(a) real axis (b) imaginary axis (c) circle (d) ellipse