

CHAPTER-5
COMPLEX NUMBERS
01 MARK TYPE QUESTIONS

Q. NO	QUESTION	MARK
1.	$(-i)(2i)(-\frac{1}{8}i)$ in the form of $(a + ib)$ is ----- a) $1/4i$ b) $-1/4i$ c) $16i$ d) $-16i$	1
2.	The modulus of $2 - 3i$ is ----- a) $\sqrt{13}$ b) $\sqrt{6}$ c) $-\sqrt{6}$ d) $-\sqrt{13}$	1
3.	Find the multiplicative inverse of $\frac{1}{i}$ a) i b) $-i$ c) $-\frac{1}{i}$ d) 1	1
4.	The value of $Z_1 - Z_2$ (where $Z_1 = 6 + 3i$ and $Z_2 = 2 - 3i$) is ---- a) $5-i$ b) $4+4i$ c) $5-2i$ d) $4+2i$	1
5.	The value of i^{-39} is ----- a) $-i$ b) $-\frac{1}{i}$ c) $3i$ d) i	1
6.	If $z_1 = 1-4i$ and $z_2 = 5+i$, then $\text{Re}(z_1 z_2)$ is ----- a) 9 b) 8 c) 4 d) 6	1
7.	If $4x + i(3x - y) = 3 + i(-6)$, where, x and y are real numbers, then the value of x and y are ----- and ----- a) $x = \frac{3}{4}, y = \frac{33}{4}$ b) $x = \frac{1}{2}, y = -\frac{1}{3}$ c) $x = \frac{5}{16}, y = \frac{7}{13}$ d) $x = \frac{7}{9}, y = \frac{14}{9}$	1
8.	The simplified value of $\frac{(1-i)^3}{1-i^3}$ is ----- a) $-i$ b) $-2i$	1

	c) -2 d) 1	
9.	The value of $\sqrt{-169}$ is ----- a) -13i b) $\pm 13i$ c) 13i d) none of these	1
10.	Find the value of $\sqrt{-16} + 2\sqrt{-4} + 3\sqrt{-9}$ a) 17i b) 15i b) -15i d) -17i	1
11.	Find the value of $\sqrt{-25} + 3\sqrt{-4} + 2\sqrt{-9}$ a) 17i b) 18i c) - 17 d) - 18	1
12.	Find the sum of : $-4 + 3i$ and $5i - 3$ a) $-8i + 7$ b) $7 + 8i$ c) $8i - 7$ d) $-7 - 8i$	1
13.	Evaluate i^{-999} a) i b) -i c) 2i d) - 2i	1
14.	Find x and y if $(3y - 2) + i(7 - 2x) = 0$ a) $3/2, 7/2$ b) $-3/2, -7/2$ c) $7/2, 3/2$ d) $7/2, 2/3$	1
15.	Find the value of : $(6 + i) \times (3 - 2i)$	1

	a) $18 - 2i$ b) $18 - 12i$ c) $20 - 9i$ d) $9 - 20i$	
16.	Write the conjugate of $z = 2i - 7$ a) $2i + 7$ b) $7 - 2i$ c) $-7 - 2i$ d) $7i - 2$	1
17.	The value of θ for which $z = \cos \theta + i \sin \theta$ is purely imaginary is a) 0 b) $\pi/2$ c) π d) 2π	1
18.	The modulus of $5 + 4i$ is – a) $\pm \sqrt{41}$ b) 3 c) ± 3 d) $\sqrt{41}$	1
19.	For $z = 4 - 2i$, what is the value of $\operatorname{Im} \left(\frac{1}{z\bar{z}} \right)$? a) $\frac{1}{20}$ b) $\frac{1}{2\sqrt{5}}$ c) 0 d) 1	1
20.	Assertion : Value of $\sqrt{-16} \times \sqrt{-25} = -20$ Reason : $\sqrt{a} \times \sqrt{b} = \sqrt{ab}$ only if $a > 0, b > 0$ or $a > 0, b < 0$ or $a < 0, b > 0$ a) Both statements are correct and second statement is the correct explanation of first statement.	1

	b) Both statements are correct but second statement is not the correct explanation of first statement. c) First statement is correct but second statement is incorrect. d) First statement is incorrect but second statement is correct.	
21.	The real solutions of the equation $x^2 + 4 = 0$ are 2 b) -2 c) ± 2 d) Does not Exist	1
22.	By the help of discriminant $D = \sqrt{b^2 - 4ac}$, we can find a) Real Solutions only b) Nature of roots c) Complex roots only d) None of them is correct.	1
23.	For the complex number $Z = -4 - 5i$, the Re Z and Im Z are respectively a) Re Z = -4, Im Z = -5 b) Re Z = -5, Im Z = -4 c) Re Z = -4, Im Z = 5 d) Re Z = -5, Im Z = 4	1
24.	The value of i^{101} is 1 b) -i c) i d) 0	1
25.	Which one is incorrect a) $\sqrt{ab} = \sqrt{a}\sqrt{b}$, $a < 0$, $b < 0$ b) $\sqrt{ab} = \sqrt{a}\sqrt{b}$, $a > 0$, $b < 0$ c) $\sqrt{ab} = \sqrt{a}\sqrt{b}$, $a < 0$, $b > 0$ d) $\sqrt{ab} = \sqrt{a}\sqrt{b}$, $a > 0$, $b > 0$	1
26.	Geometrically $z = \sqrt{x^2 + y^2}$ represents a) Distance of the point (0,0) from (x,y) b) Distance of the point (0,0) from (-x,-y) c) Distance of the point (0,0) from (x,-y) d) All the above three.	1
27.	Which of the following relation is true, if $z = x + iy$? a) Conjugate of $z = \sqrt{x^2 + y^2}$ b) $z\bar{z} = z$ c) $z\bar{z} = z ^2$ d) $z\bar{z} = z$	1
28.	If $\left[\frac{1+i}{1-i}\right]^x = 1$, then the least positive integral value of x is 1 b) 2 c) 3 d) 4	1
29.	Assertion (A): If α and β are different complex numbers and $\beta = 1$, then $\left \frac{\beta - \alpha}{1 - \bar{\alpha}\beta}\right = 1$ Reason(R) : $z\bar{z} = z ^2$	1

	(a) Both A and R is true and R is the correct explanation of A (b) Both A and R is true and R is not the correct explanation of A (c) A is true but R is false (d) A is false but R is true	
30.	Assertion (A): If $z = x + iy$, then $ z = \sqrt{x^2 + y^2}$ Reason(R) : <i>Geometrically</i> , the point (x,-y) is the mirror image of the point (x,y) on the real axis (a) Both A and R is true and R is the correct explanation of A (b) Both A and R is true and R is not the correct explanation of A (c) A is true but R is false (d) A is false but R is true	1
31.	If $Z = \left(\frac{1+i}{1-i}\right)$, then z^4 equals a) 1 b) -1 c) 0 d) none of these	1
32.	If $x+iy = (1+i)(1+2i)(1+3i)$, then x^2+y^2 a) 0 b) 1 c) 100 d) none of these	1
33.	If $x+iy = \frac{3+5i}{7-6i}$, then $y =$ a) $\frac{9}{85}$ b) $\frac{-9}{85}$ c) $\frac{53}{85}$ d) none of these	1
34.	If $\frac{1-ix}{1+ix} = a+ib$, then $a^2+b^2 =$ a) 1 b) -1 c) 0 d) none of these	1
35.	$\frac{1+2i+3i^2}{1-2i+3i^2}$ equals a) i b) -1 c) -i d) 4	1
36.	The value of $(1+i)^4 + (1-i)^4$ is a) 8 b) 4 c) -8 d) -4	1
37.	If $\left(\frac{1+i}{1-i}\right)^n = 1$, then n is a) $2m+1$ b) $4m$ c) $2m$ d) $4m+1$ where $m \in N$	1
38.	The equation $ z+1-i = z-1+i $ represents a a) Straight line b) circle c) parabola d) hyperbola	1
39.	If a, b are the roots of the equation $x^2+x+1=0$, then $a^2+b^2 =$ a) 1 b) 2 c) -1 d) 3	1
40.	The number of solutions of $x^2 + x-1 = 1$ is a) 0 b) 1 c) 2 d) 3	1
41.	The value of $1 + i^2 + i^2 + i^2 + i^2 + i^2 + \dots + i^{2n}$ is a) Positive b) Negative c) 0 d) Cannot be evaluated	1
42.	If $a + ib = c + id$, then	1

	a) $a^2 + c^2 = 0$ b) $b^2 + c^2 = 0$ c) $b^2 + d^2 = 0$ d) $a^2 + b^2 = c^2 + d^2$	
43.	The simplified value of $(1-i)^3/(1-i^3)$ is a) 1 b) -2 c) $-i$ d) $2i$	1
44.	$\sin x + \cos 2x$ and $\cos x - i \sin 2x$ are conjugate to each other for: a) $X = n$ b) $X = [n + (1/2)](\pi/2)$ c) 0 d) No value of x	1
45.	The value of $\sqrt{-25} + 3\sqrt{-4} + 2\sqrt{-9}$ is a) $13i$ b) $-13i$ c) $17i$ d) $-17i$	1
46.	The least value of n for which $\{(1+i)/(1-i)\}^n$ is real, is a) 1 b) 2 c) 3 d) 4	1
47.	The value of i^{-999} is a) 1 b) -1 c) i d) $-i$	1
48.	The value of x and y if $(3y-2) + i(7-2x) = 0$, a) $X=7/2, y=2/3$ b) $X=2/7, y=2/3$ c) $X=7/2, y=3/2$ d) $X=2/7, y=3/2$	1
49.	If $x + 1/x = 1$ find the value of $x^{2000} + \frac{1}{x}$ is a) 0 b) 1 c) -1 d) None of them	1
50.	The complex numbers $\sin x + i \cos 2x$ are conjugate to each other for a) $X = n\pi$ b) $X = [n + (1/2)]\pi$	1

	c) 0 d) No value of x	
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ANSWERS:

Q. NO	ANSWER	MARKS
1.	$(i)(2i)(-\frac{1}{8}i) = (-2i^2)(-\frac{1}{8}i) = 2(-\frac{1}{8}i) = -\frac{1}{4}i$	1
2.	2-3i Here a=2,b=-3 Modulus= $\sqrt{a^2 + b^2}$ $=\sqrt{2^2 + (-3)^2}$ $=\sqrt{4 + 9} = \sqrt{13}$	1
3.	$\frac{1}{i} = \frac{i}{i.i} = \frac{i}{i^2} = \frac{i}{-1} = -i \quad (i^2 = -1)$	1
4.	$z_1 = 6+3i$ $z_2 = 2-i$ $z_1 - z_2 = 6+3i - (2-i)$ $= 6+3i-2+i$ $= 4+4i$	1
5.	i^{-39} $= i^{-4 \times 9 - 3}$ $= i^{-4 \times 9} i^{-3}$ $= (i^4)^{-9} i^{-3}$ $= (1)^{-9} i^{-3}$ $= \frac{-1}{i^3}$ $= \frac{-1}{i}$	1
6.	$z_1 = 1-4i$ $z_2 = 5+i$ $z_1.z_2 = (1-4i)(5+i)$ $= 5+i-20i-4i^2$ $= 5-19i+4 \quad (i^2 = -1)$ $= 9-19i$ $\text{Re}(z_1 z_2) = 9$	1
7.	$4x+i(3x-y)=3+i(-6)$ $4x+i3x-iy=3-i6$ $4x+i(3x-y)=3-i6$ Comparing real part and imaginary part $4x=3, 3x-y=-6$	1

	$x = \frac{3}{4}, 3\left(\frac{3}{4}\right) - y = -6$ $\frac{9}{4} - y = -6$ $y = \frac{9}{4} + 6$ $y = \frac{33}{4}$	
8.	$\frac{(1-i)^3}{1-i^3} = \frac{(1-i)(1+i^2+i)}{(1-i)} = (1 + i^2 + i) = (1-1+i) = i$	1
9.	$\sqrt{-169} = 13i$	1
10.	$\sqrt{-16} + 2\sqrt{-4} + 3\sqrt{-9}$ $= 4i + 2(2i) + 3(3i)$ $= 4i + 4i + 9i$ $= 17i$	1
11.	a)	1
12.	c)	1
13.	a)	1
14.	d)	1
15.	c)	1
16.	c)	1
17.	b)	1
18.	d)	1
19.	c)	1
20.	b)	1
21.	d)	1
22.	b)	1
23.	a)	1
24.	c)	1
25.	a)	1
26.	d)	1
27.	c)	1
28.	d)	1
29.	a)	1
30.	b)	1
31.	a	1
32.	c	1
33.	c	1
34.	a	1
35.	c	1
36.	c	1
37.	b	1
38.	a	1
39.	c	1
40.	a	1

41.	d)	1
42.	d)	1
43.	b)	1
44.	d)	1
45.	c)	1
46.	b)	1
47.	c)	1
48.	a)	1
49.	c)	1
50.	d)	1