

SATISH CHANDRA MEMORIAL SCHOOL

Class XI — Mathematics

Chapter: Complex Numbers



SECTION – A

(1 mark each)

Q 1.If $4x + i(3x - y) = 3 + i(-6)$, where x and y are real numbers, then the values of x and y are:

- (a) $x = 3, y = 4$ (b) $x = 3/4, y = 33/4$ (c) $x = 4, y = 3$ (d) $x = 33, y = 4$

Q 2.If z is non-zero complex number and $z = a + ib$, then multiplicative inverse of z is:

- (a) $a/(a^2 + b^2) + (-bi)/(a^2 + b^2)$ (b) $a/(a^2 - b^2) + (-bi)/(a^2 - b^2)$
(c) $a/(a^2 - b^2) + (ib)/(a^2 - b^2)$ (d) $a/(a^2 + b^2) + (-bi)/(a^2 + b^2)$

Q 3.The value of $(z + 3)(\bar{z} + 3)$ is equivalent to:

- (a) $|z + 3|^2$ (b) $|z - 3|$ (c) $z^2 + 3$ (d) None of these

Q 4.If $a + ib = c + id$, then:

- (a) $a^2 + c^2 = 0$ (b) $b^2 + c^2 = 0$ (c) $b^2 + d^2 = 0$ (d) $a^2 + b^2 = c^2 + d^2$

Q 5.If $z \neq 0$ is a complex number, then:

- (a) $\operatorname{Re}(z) = 0 \Rightarrow \operatorname{Im}(z^2) = 0$ (b) $\operatorname{Re}(z) = 0 \Rightarrow \operatorname{Re}(z^2) + \operatorname{Im}(z^2) = 0$
(c) $\operatorname{Re}(z) = 0 \Rightarrow \operatorname{Re}(z^2) = 0$ (d) None of the above

Q 6.Roots of $x^2 + 2 = 0$ are: (a) $\pm\sqrt{2}i$ (b) 2 (c) $2i$ (d) None of these

Q 7.If $x^2 + x + 1 = 0$, then which of the following are correct?

- (a) $x = (-1 \pm \sqrt{3}i)/2$ (b) $x = (-i \pm \sqrt{3})/2$
(c) $x = (1 \pm \sqrt{3}i)/2$ (d) $x = (1 \pm \sqrt{3}i)/4$

Q 8.If difference in roots of the equation $x^2 - px + 8 = 0$ is 2, then p is equal to: (a) ± 6 (b) ± 2 (c) ± 1 (d) ± 5

SECTION – B**(2 marks each)**

Q 11.Find the value of $[i^{19} + (1/i)^{25}]^2$.

Or

Find the modulus and conjugate of the complex number $(1 + 2i)/(1 - 3i)$.

Q 12.Find the real values of x and y for which $(x + iy)(2 - 3i) = 4 + i$.

Q 13.Find the value of $1 + i^2 + i^4 + i^6 + \dots + i^{20}$.

OR

Find the value of i^{-1097} .