1. The locus represented by $|z-1|=|z+i|$ is -

(1) a circle of radius 1
(2) an ellipse with foci at $(1, 0)$ and $(0, -1)$
(3) a straight line through the origin
(4) a circle on the line joining $(1, 0)$, $(0, 1)$ as diameter

2. If $\operatorname{Re}\left(\frac{z-1}{2z+i}\right)=1$, where $z=x+iy$, then the point (x, y) lies on a

(1) circle whose centre is at $\left(-\frac{1}{2}, -\frac{3}{2}\right)$
(2) straight line whose slope is $-\frac{2}{3}$
(3) straight line whose slope is $\frac{3}{2}$
(4) circle whose diameter is $\frac{\sqrt{5}}{2}$

3. Let $\left|z-\left(1+i\right)\right|=2\sqrt{2}$ then the maximum value of $[|z|]$ (Where $[.]$ is greatest integer function)

4. If $z=x+iy$ and $\left|\frac{z-5i}{z+5i}\right|=1$, then z lies on

(1) x-axis
(2) y-axis
(3) line $y=5$
(4) None of these

5. If $P(z)$ is a variable point in the complex plane such that $\operatorname{Im}\left(-\frac{1}{z}\right)=\frac{1}{4}$, then the value of the perimeter of the locus of $P(z)$ is (use $\pi=3.14$)

6. Number of complex numbers z satisfying $|z-3-i|=|z-9-i|$ and $|z-3+3i|=3$ are

(1) one
(2) two
(3) three
(4) four

7. A function f is defined by $f(z)=i\bar{z}$, where $i=\sqrt{-1}$ and $\bar{z}$ is the complex conjugate of z. The number of values of z which satisfies both $|z|=5$ and $f(z)=z$, is:

(1) 0
(2) 1
(3) 2
(4) 4

8. The number of solutions for the equations $|z-1|=|z-2|=|z-i|$ is

(1) One solution
(2) 3 solutions
(3) 2 solutions
(4) No solution

9. For a complex number z, if λ and μ are the greatest and least distance between the curves $|z|=2$ and $|z-5-12i|=2$ respectively, then the value of $\lambda^2+\mu^2$ is

(1) 350
(2) 370
(3) 390
(4) 410

10. If $|z-2-3i|+|z+2-6i|=4$, where $i=\sqrt{-1}$, then locus of $P(z)$ is

(1) An ellipse
(2) ϕ
(3) Line segment joining of points $2+3i$ and $-2+6i$
(4) None of these