**Complex Numbers**

**MCQ-Single correct**

1. Let ω be a complex number such that 2 ω + 1 = z where . If

 = 3k , then k is equal to :

1. -z (2) z

(3) -1 (4) 1 **[2017]**

2. A value of θ for which  is purely imaginary, is :

(1)  (2) 

(3)  (4)  **[2016]**

3. A complex number z is said to be unimodular if |z| = 1. Suppose z1 and z2 are complex numbers such that  is unimodular and  is not unimodular. Then the point  lies on a :

(1) straight line parallel to y-axis (2) circle of radius 2.

(3) circle of radius  (4) straight line parallel to x-axis. **[2015]**

4. If z is a complex number such that  then the minimum value of  **[2014]**

(1) is equal to 5/2 (2) lies in the interval (1,2)

(3) is strictly greater than 5/2 (4) is strictly greater than 3/2 but less than 5/2

5. If z is a complex number of unit modulus and argument θ , then  equals

(1)  (2) 

(3)  (4) - θ **[2013]**

6. If z ≠ 1 and  is real, then the point represented by the complex number z lies

(1) either on the real axis or on a circle not passing through the origin.

(2) on the imaginary axis.

(3) either on the real axis or on a circle passing through the origin.

(4) on a circle with centre at the origin. **[2012]**

7. The number of complex numbers z such that |z - 1| = |z + 1| = |z - i| equals

(1) 1 (2) 2

(3) ∞ (4) 0 **[2010]**

8. If  then the maximum value of |z| is equal to

(1)  (2) 

(3) 2 (4)  **[2009]**

9. The conjugate of a complex number is . Then the complex number is

(1)  (2) 

(3)  (4)  **[2008]**

10. If |z + 4| ≤ 3, then the maximum value of |z + 1| is

(1) 4 (2) 10

(3) 6 (4) 0 **[2007]**

11. The value of  is

(1) I (2) 1

(3) -1 (4) -I **[2006]**

12. If  where z is a complex number, then the value of

 +  +  + …. +  is

1. 18 (2) 54

(3) 6 (4) 12 **[2006]**

13. If the cube roots of unity are 1 , ω , ω2 then the roots of the equation (x – 1)3 + 8 = 0

(1) -1 , -1 + 2ω , -1 - 2ω2 (2) -1, -1, -1

(3) -1, 1 -2ω, 1 - 2ω2 (4) -1, 1 + 2ω, 1 + 2ω2 **[2005]**

14. If z1 and z2 are two non-zero complex numbers such that |z1 + z2| = |z1| + |z2| then argz1 – argz2 is equal to

(1)  (2) -π

(3) 0 (4)  **[2005]**

15. If ω =  and |ω| = 1, then z lies on

(1) an ellipse (2) a circle

(3) a straight line (4) a parabola **[2005]**

16. Let z, w be complex numbers such that  and arg zw = π . Then arg z equals

(1) π/4 (2) 5π/4

(3) 3π/4 (4) π/2 **[2004]**

17. If z = x – iy and z1/3 = p + iq, then  is equal to

(1) 1 (2) -2

(3) 2 (4) -1 **[2004]**

18. If |z2-1| = |z|2 + 1, then z lies on

(1) the real axis (2) an ellipse

(3) a circle (4) the imaginary axis. **[2004]**

19. Let z1 and z2 be two roots of the equation z2 + az + b = 0, z being complex. Further, assume that the origin z1 and z2 form an equilateral triangle, then

(1) a2 = b (2) a2 = 2b

(3) a2 = 3b (4) a2=4b **[2003]**

20. If z and ω are two non-zero complex numbers such that |zω| =1, and Arg (z) – Arg(ω) = π/2 , then  is equal to

(1) 1 (2) -1

(3) I (4) -I **[2003]**

21. If  , then

(1) x = 4n, where n is any positive integer

(2) x = 2n, where n is any positive integer

(3) x = 4n + 1, where n is any positive integer

(4) x = 2n +1, where n is any positive integer **[2003]**

22. z and w are two non-zero complex numbers such that |z| = |w| and Arg z + Arg w = π, then z equals

(1)  (2) 

(3)  (4)  **[2002]**

23. If |z - 4| < |z - 2|, its solution is given by

(1) Re (z) > 0 (2) Re (z) < 0

(3) Re (z) > 3 (4) Re (z) > 2 **[2002]**

24. The locus of the centre of a circle which touches the circle |z – z1| = a and |z – z2| = b externally ( z, z1 and z2 are complex numbers) will be

(1) an ellipse (2) a hyperbola

(3) a circle (4) none of these **[2002]**