**1)**  Let is purely imaginary . Then the sum of the elements in is

**[JEE Main 2023 (Online) 8th April Evening Shift]**

**A)**

**B)**

**C)**

**D)**

**2)** Let the complex number be such that is purely imaginary. If , then is equal to:

**[JEE Main 2023 (Online) 10th April Morning Shift]**

**A)**

**B)**

**C)**

**D)**

**3)** Let . Then which of the following is NOT correct?

**[JEE Main 2023 (Online) 10th April Evening Shift]**

**A)**

**B)**

**C)**

**D)**

**4)** Let be the point obtained by the rotation of about the origin through a right angle in the anticlockwise direction, and be the point obtained by the rotation of about the origin through a right angle in the clockwise direction. Then the principal argument of is equal to

**[JEE Main 2023 (Online) 11th April Morning Shift]**

**A)**

**B)**

**C)**

**D)**

**Numerical Question**

**5)** Let . If , then  
  
 is equal to \_\_\_\_\_\_\_\_\_.

**[JEE Main 2023 (Online) 11th April Evening Shift]**

**6)** For , let and . Then among the two statements:  
(S1): If , then the set A contains all the real numbers

(S2) : If , then the set B contains all the real numbers,

**[JEE Main 2023 (Online) 11th April Evening Shift]**

**A)** both are false

**B)** only (S1) is true

**C)** only (S2) is true

**D)** both are true

**7)** Let be the circle in the complex plane with centre and radius . Let and the complex number be outside the circle such that . If and are collinear, then the smaller value of is equal to

**[JEE Main 2023 (Online) 12th April Morning Shift]**

**A)**

**B)**

**C)**

**D)**

**Numerical Question**

**8)** Let . Let be the circle of radius 1 in the first quadrant touching the line and the -axis. If the curve intersects at and , then is equal to \_\_\_\_\_\_\_\_\_\_

**[JEE Main 2023 (Online) 13th April Morning Shift]**

**9)** Let . Then is equal to

**[JEE Main 2023 (Online) 13th April Evening Shift]**

**A)**

**B)** 4

**C)** 3

**D)**

**10)** If the set is equal to the interval , then is equal to :

**[JEE Main 2023 (Online) 15th April Morning Shift]**

**A)** 36

**B)** 27

**C)** 42

**D)** 30

**11)** Let and then and are roots of the equation.

**[JEE Main 2023 (Online) 24th January Morning Shift]**

**A)**

**B)**

**C)**

**D)**

**12)** The value of is

**[JEE Main 2023 (Online) 24th January Evening Shift]**

**A)**

**B)**

**C)**

**D)**

**13)** Let and . The set represents a

**[JEE Main 2023 (Online) 25th January Morning Shift]**

**A)** hyperbola with the length of the transverse axis 7

**B)** hyperbola with eccentricity 2

**C)** straight line with the sum of its intercepts on the coordinate axes equals

**D)** straight line with the sum of its intercepts on the coordinate axes equals

**14)** Let be a complex number such that . Then lies on the circle of radius 2 and centre :

**[JEE Main 2023 (Online) 25th January Evening Shift]**

**A)** (0, 2)

**B)** (0, 0)

**C)** (0, 2)

**D)** (2, 0)

**15)** For two non-zero complex numbers and , if and , then which of the following are possible?  
A. and   
B. and   
C. and   
D. and   
Choose the correct answer from the options given below:

**[JEE Main 2023 (Online) 29th January Morning Shift]**

**A)** A and C

**B)** A and B

**C)** B and D

**D)** B and C

**Numerical Question**

**16)** Let and . Then is equal to \_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2023 (Online) 29th January Evening Shift]**

**Numerical Question**

**17)** Let and . Then is equal to \_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2023 (Online) 30th January Morning Shift]**

**18)** For all on the curve , let the locus of the point be the curve . Then :

**[JEE Main 2023 (Online) 31st January Morning Shift]**

**A)** the curves and intersect at 4 points

**B)** the curve lies inside

**C)** the curve lies inside

**D)** the curves and intersect at 2 points

**19)** If the center and radius of the circle are respectively and , then is equal to

**[JEE Main 2023 (Online) 1st February Morning Shift]**

**A)** 12

**B)** 10

**C)** 11

**D)** 9

**20)** The complex number is equal to :

**[JEE Main 2023 (Online) 31st January Evening Shift]**

**A)**

**B)**

**C)**

**D)**

**21)** Let be two real numbers such that . IF the complex number is of unit modulus and lies on the circle , then a possible value of , where is greatest integer function, is :

**[JEE Main 2023 (Online) 1st February Evening Shift]**

**A)**

**B)**

**C)** 0

**D)** 1

**22)** Let . Then the set of all values of , for which for some , is

**[JEE Main 2022 (Online) 29th July Evening Shift]**

**A)**

**B)**

**C)**

**D)**

**23)** If be a complex number such that , then the maximum value of is :

**[JEE Main 2022 (Online) 29th July Evening Shift]**

**A)**

**B)** 1

**C)**

**D)**

**24)** If , then is equal to :

**[JEE Main 2022 (Online) 29th July Morning Shift]**

**A)** 244

**B)** 224

**C)** 245

**D)** 265

**Numerical Question**

**25)** Let be complex numbers satisfying . Then the least value of , such that , is equal to \_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2022 (Online) 28th July Evening Shift]**

**26)** Let and . Then, for and , the least value of is :

**[JEE Main 2022 (Online) 28th July Morning Shift]**

**A)** 0

**B)**

**C)**

**D)**

**27)** Let S be the set of all , for which the complex number is purely imaginary and is purely real. Let . Then is equal to :

**[JEE Main 2022 (Online) 27th July Evening Shift]**

**A)** 3

**B)** 3 i

**C)** 1

**D)** 2 i

**Numerical Question**

**28)** Let . Then is equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2022 (Online) 27th July Morning Shift]**

**29)** Let the minimum value of is attained at . Then is equal to

**[JEE Main 2022 (Online) 27th July Morning Shift]**

**A)** 1000

**B)** 1024

**C)** 1105

**D)** 1196

**30)** If satisfies and , then

**[JEE Main 2022 (Online) 26th July Evening Shift]**

**A)**

**B)**

**C)**

**D)**

**31)** Let O be the origin and A be the point . If B is the point , , such that OAB is a right angled isosceles triangle with OB as hypotenuse, then which of the following is NOT true?

**[JEE Main 2022 (Online) 26th July Morning Shift]**

**A)**

**B)**

**C)**

**D)**

**32)** For if the minimum value of is , then a value Question: of is \_\_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2022 (Online) 25th July Evening Shift]**

**A)** 3

**B)**

**C)** 4

**D)**

**33)** For , let and . Then the number of elements in the set is :

**[JEE Main 2022 (Online) 25th July Morning Shift]**

**A)** 0

**B)** 2

**C)** 3

**D)** 4

**34)** If are the roots of the equation , then is equal to :

**[JEE Main 2022 (Online) 25th July Morning Shift]**

**A)** 4

**B)** 1

**C)** 1

**D)** 4

**35)** The real part of the complex number is equal to :

**[JEE Main 2022 (Online) 30th June Morning Shift]**

**A)**

**B)**

**C)**

**D)**

**36)** Let   
and . Then, B :

**[JEE Main 2022 (Online) 24th June Morning Shift]**

**A)** is an empty set

**B)** contains exactly two elements

**C)** contains exactly three elements

**D)** is an infinite set

**Numerical Question**

**37)** Let S = {z C : |z 3| 1 and z(4 + 3i) + (4 3i) 24}. If + i is the point in S which is closest to 4i, then 25( + ) is equal to \_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2022 (Online) 24th June Evening Shift]**

**38)** Let a circle C in complex plane pass through the points , and . If is a point on C such that the line through z and z1 is perpendicular to the line through z2 and z3, then is equal to:

**[JEE Main 2022 (Online) 25th June Morning Shift]**

**A)**

**B)**

**C)**

**D)**

**39)** Let z1 and z2 be two complex numbers such that and . Then

**[JEE Main 2022 (Online) 25th June Evening Shift]**

**A)**

**B)**

**C)**

**D)**

**Numerical Question**

**40)** If , , then   
  
 is equal to \_\_\_\_\_\_\_\_\_.

**[JEE Main 2022 (Online) 26th June Evening Shift]**

**41)** Let and . Then A B is :

**[JEE Main 2022 (Online) 26th June Morning Shift]**

**A)** a portion of a circle centred at that lies in the second and third quadrants only

**B)** a portion of a circle centred at that lies in the second quadrant only

**C)** an empty

**D)** a portion of a circle of radius that lies in the third quadrant only

**42)** The area of the polygon, whose vertices are the non-real roots of the equation is :

**[JEE Main 2022 (Online) 27th June Morning Shift]**

**A)**

**B)**

**C)**

**D)**

**43)** The number of points of intersection of   
  
 and , z C, is

**[JEE Main 2022 (Online) 27th June Evening Shift]**

**A)** 0

**B)** 1

**C)** 2

**D)** 3

**Numerical Question**

**44)** The number of elements in the set {z = a + ib C : a, b Z and 1 < | z 3 + 2i | < 4} is \_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2022 (Online) 28th June Morning Shift]**

**Numerical Question**

**45)** Sum of squares of modulus of all the complex numbers z satisfying is equal to \_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2022 (Online) 28th June Evening Shift]**

**46)** Let arg(z) represent the principal argument of the complex number z. Then, |z| = 3 and arg(z 1) arg(z + 1) = intersect

**[JEE Main 2022 (Online) 29th June Evening Shift]**

**A)** exactly at one point.

**B)** exactly at two points.

**C)** nowhere.

**D)** at infinitely many points.

**Numerical Question**

**47)** Let . Let attains minimum and maximum values, respectively, at z1 S and z2 S. If , where and are integers, then the value of + is equal to \_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2022 (Online) 29th June Morning Shift]**

**48)** Let and be the roots of the equation x2 + (2i 1) = 0. Then, the value of |8 +  8 | is equal to:

**[JEE Main 2022 (Online) 29th June Morning Shift]**

**A)** 50

**B)** 250

**C)** 1250

**D)** 1500

**Numerical Question**

**49)** If for the complex numbers z satisfying | z 2 2i | 1, the maximum value of | 3iz + 6 | is attained at a + ib, then a + b is equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2021 (Online) 1st September Evening Shift]**

**50)** If z is a complex number such that is purely imaginary, then the minimum value of | z (3 + 3i) | is :

**[JEE Main 2021 (Online) 31st August Evening Shift]**

**A)**

**B)**

**C)**

**D)**

**Numerical Question**

**51)** A point z moves in the complex plane such that , then the minimum value of is equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2021 (Online) 31st August Morning Shift]**

**52)** If , then :

**[JEE Main 2021 (Online) 27th August Morning Shift]**

**A)** S contains exactly two elements

**B)** S contains only one element

**C)** S is a circle in the complex plane

**D)** S is a straight line in the complex plane

**Numerical Question**

**53)** The least positive integer n such that is a positive integer, is \_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2021 (Online) 26th August Evening Shift]**

**54)** If , then p and q are roots of the equation :

**[JEE Main 2021 (Online) 26th August Evening Shift]**

**A)**

**B)**

**C)**

**D)**

**Numerical Question**

**55)** Let , . Then the value of is \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2021 (Online) 26th August Morning Shift]**

**56)** The equation represents a circle with :

**[JEE Main 2021 (Online) 26th August Morning Shift]**

**A)** centre at (0, 1) and radius

**B)** centre at (0, 1) and radius

**C)** centre (0, 0) and radius

**D)** centre at (0, 1) and radius 2

**57)** Let C be the set of all complex numbers. Let  
  
 and   
  
.  
  
Then the number of elements in is equal to :

**[JEE Main 2021 (Online) 27th July Morning Shift]**

**A)** 1

**B)** 0

**C)** 2

**D)** Infinite

**Numerical Question**

**58)** The equation of a circle is Re(z2+ 2(Im(z))2 + 2Re(z) = 0, where z = x + iy. A line which passes through the center of the given circle and the vertex of the parabola, x2 6x y + 13 = 0, has y-intercept equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2021 (Online) 25th July Evening Shift]**

**Numerical Question**

**59)** If the real part of the complex number is zero, then the value of sin23 + cos2 is equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2021 (Online) 27th July Evening Shift]**

**60)** Let C be the set of all complex numbers. Let  
  
S1 = {zC : |z 2| 1} and   
  
S2 = {zC : z(1 + i) + (1 i) 4}.  
  
Then, the maximum value of for z S2 is equal to :

**[JEE Main 2021 (Online) 27th July Evening Shift]**

**A)**

**B)**

**C)**

**D)**

**Numerical Question**

**61)** Let , where i = . Then the number of 2-digit numbers in the set S is \_\_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2021 (Online) 25th July Morning Shift]**

**62)** Let n denote the number of solutions of the equation z2 + 3 = 0, where z is a complex number. Then the value of is equal to

**[JEE Main 2021 (Online) 22th July Evening Shift]**

**A)** 1

**B)**

**C)**

**D)** 2

**63)** If z and are two complex numbers such that and , then is :  
  
(Here arg(z) denotes the principal argument of complex number z)

**[JEE Main 2021 (Online) 20th July Morning Shift]**

**A)**

**B)**

**C)**

**D)**

**64)** Let a complex number be w = 1 i. Let another complex number z be such that |zw| = 1 and arg(z) arg(w) = . Then the area of the triangle with vertices origin, z and w is equal to :

**[JEE Main 2021 (Online) 18th March Evening Shift]**

**A)** 4

**B)**

**C)** 2

**D)**

**Numerical Question**

**65)** Let z1, z2 be the roots of the equation z2 + az + 12 = 0 and z1, z2 form an equilateral triangle with origin. Then, the value of |a| is

**[JEE Main 2021 (Online) 18th March Morning Shift]**

**66)** If the equation represents a circle where a, d are real constants then which of the following condition is correct?

**[JEE Main 2021 (Online) 18th March Morning Shift]**

**A)** ||2 ad 0

**B)** ||2 ad > 0 and aR {0}

**C)** ||2 ad 0 and aR

**D)**  = 0, a, dR+

**67)** Let S1, S2 and S3 be three sets defined as  
  
S1= {zC : |z 1| }  
  
S2 = {zC : Re((1 i)z) 1}  
  
S3 = {zC : Im(z) 1}  
  
Then the set S1 S2 S3

**[JEE Main 2021 (Online) 17th March Evening Shift]**

**A)** has exactly three elements

**B)** is a singleton

**C)** has infinitely many elements

**D)** has exactly two elements

**68)** The area of the triangle with vertices A(z), B(iz) and C(z + iz) is :

**[JEE Main 2021 (Online) 17th March Morning Shift]**

**A)** 1

**B)** | z |2

**C)** | z + iz |2

**D)**

**69)** The least value of |z| where z is complex number which satisfies the inequality , is equal to :

**[JEE Main 2021 (Online) 16th March Evening Shift]**

**A)** 8

**B)** 3

**C)** 2

**D)**

**Numerical Question**

**70)** Let z and be two complex numbers such that and Re() has minimum value. Then, the minimum value of n N for which n is real, is equal to \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2021 (Online) 16th March Morning Shift]**

**71)** Let a complex number z, |z| 1,   
  
satisfy . Then, the largest value of |z| is equal to \_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2021 (Online) 16th March Morning Shift]**

**A)** 5

**B)** 8

**C)** 6

**D)** 7

**Numerical Question**

**72)** Let z be those complex numbers which satisfy  
  
| z + 5 | 4 and z(1 + i) + (1 i) 10, i = .  
  
If the maximum value of | z + 1 |2 is + , then the value of ( + ) is \_\_\_\_\_\_\_\_\_\_\_\_.

**[JEE Main 2021 (Online) 26th February Evening Shift]**

**73)** If , R are such that 1 2i (here i2 = 1) is a root of z2 + z + = 0, then ( ) is equal to :

**[JEE Main 2021 (Online) 25th February Evening Shift]**

**A)** 7

**B)** 7

**C)** 3

**D)** 3

**74)** Let the lines (2 i)z = (2 + i) and (2 i)z + (i 2) 4i = 0, (here i2 = 1) be normal to a circle C. If the line iz + + 1 + i = 0 is tangent to this circle C, then its radius is :

**[JEE Main 2021 (Online) 25th February Morning Shift]**

**A)**

**B)**

**C)**

**D)**

**Numerical Question**

**75)** Let . If , and be the greatest integral part of | k |. Then is equal to \_\_\_\_\_\_\_\_\_.

**[JEE Main 2021 (Online) 24th February Evening Shift]**

**Numerical Question**

**76)** If the least and the largest real values of a, for which the   
equation z + |z – 1| + 2i = 0  
(z C and i = ) has a solution, are p and q respectively; then 4(p2 + q2) is equal to \_\_\_\_\_\_.

**[JEE Main 2021 (Online) 24th February Morning Shift]**

**77)** Let z = x + iy be a non-zero complex number  
such that , where i = , then z lies  
on the :

**[JEE Main 2020 (Online) 6th September Evening Slot]**

**A)** line, y = –x

**B)** real axis

**C)** line, y = x

**D)** imaginary axis

**78)** The region represented by  
 {z = x + iy C : |z| – Re(z) 1} is also given by the  
 inequality:  
{z = x + iy C : |z| – Re(z) 1}

**[JEE Main 2020 (Online) 6th September Morning Slot]**

**A)** y2

**B)** y2

**C)** y2 2(x + 1)

**D)** y2 x + 1

**79)** The value of is :

**[JEE Main 2020 (Online) 5th September Evening Slot]**

**A)** –215i

**B)** –215

**C)** 215i

**D)** 65

**80)** If the four complex numbers and represent the vertices of a square of  
side 4 units in the Argand plane, then is equal to:

**[JEE Main 2020 (Online) 5th September Morning Slot]**

**A)** 4

**B)** 4

**C)** 2

**D)** 2

**81)** If a and b are real numbers such that  
   
where then a + b is  
equal to:

**[JEE Main 2020 (Online) 4th September Evening Slot]**

**A)** 33

**B)** 9

**C)** 24

**D)** 57

**82)** Let , z = x + iy and k > 0. If the curve represented  
 by Re(u) + Im(u) = 1 intersects the y-axis at the points P and Q where PQ = 5, then the value of k is :

**[JEE Main 2020 (Online) 4th September Morning Slot]**

**A)** 2

**B)** 4

**C)** 1/2

**D)** 3/2

**83)** If z1 , z2 are complex numbers such that Re(z1) = |z1 – 1|, Re(z2) = |z2 – 1| , and

arg(z1 - z2) = , then Im(z1  + z2) is equal to :

**[JEE Main 2020 (Online) 3rd September Evening Slot]**

**A)**

**B)**

**C)**

**D)**

**Numerical Question**

**84)** If , (m, n N) then the greatest common divisor of the least values of m and n is \_\_\_\_\_\_\_ .

**[JEE Main 2020 (Online) 3rd September Morning Slot]**

**85)** The imaginary part of can be :

**[JEE Main 2020 (Online) 2nd September Evening Slot]**

**A)** -2

**B)** 6

**C)**

**D)** -

**86)** The value of is :

**[JEE Main 2020 (Online) 2nd September Morning Slot]**

**A)**

**B)** -

**C)**

**D)**

**87)** If z be a complex number satisfying |Re(z)| + |Im(z)| = 4, then |z| cannot be

**[JEE Main 2020 (Online) 9th January Evening Slot]**

**A)**

**B)**

**C)**

**D)**

**88)** Let z be complex number such that  
  
 and |z| = .  
 Then the value of |z + 3i| is :

**[JEE Main 2020 (Online) 9th January Morning Slot]**

**A)**

**B)**

**C)**

**D)**

**89)** If the equation, x2 + bx + 45 = 0 (b R) has conjugate complex roots and they satisfy  
|z +1| = 2 , then

**[JEE Main 2020 (Online) 8th January Morning Slot]**

**A)** b2 – b = 42

**B)** b2 + b = 12

**C)** b2 + b = 72

**D)** b2 – b = 30

**90)** If , [0, 2], is a real number, then an argument of   
sin + icos is:

**[JEE Main 2020 (Online) 7th January Evening Slot]**

**A)**

**B)**

**C)**

**D)**

**91)** If , where z = x + iy, then the point (x, y) lies on a:

**[JEE Main 2020 (Online) 7th January Morning Slot]**

**A)** straight line whose slope is

**B)** straight line whose slope is

**C)** circle whose diameter is

**D)** circle whose centre is at

**92)** Let z C with Im(z) = 10 and it satisfies = 2i - 1 for some natural number n. Then :

**[JEE Main 2019 (Online) 12th April Evening Slot]**

**A)** n = 20 and Re(z) = –10

**B)** n = 40 and Re(z) = 10

**C)** n = 40 and Re(z) = –10

**D)** n = 20 and Re(z) = 10

**93)** The equation |z – i| = |z – 1|, i = , represents :

**[JEE Main 2019 (Online) 12th April Morning Slot]**

**A)** a circle of radius 1

**B)** the line through the origin with slope – 1

**C)** a circle of radius

**D)** the line through the origin with slope 1

**94)** If z and w are two complex numbers such that |zw| = 1 and arg(z) – arg(w) =   
, then:

**[JEE Main 2019 (Online) 10th April Evening Slot]**

**A)**

**B)**

**C)**

**D)**

**95)** If a > 0 and z = , has magnitude , then is equal to :

**[JEE Main 2019 (Online) 10th April Morning Slot]**

**A)**

**B)**

**C)**

**D)**

**96)** Let z C be such that |z| < 1. If z, then:-

**[JEE Main 2019 (Online) 9th April Evening Slot]**

**A)** 4Im( ) > 5

**B)** 5Im( ) < 1

**C)** 5Re( ) > 4

**D)** 5Re( ) > 1

**97)** All the points in the set  
  
 lie on a

**[JEE Main 2019 (Online) 9th April Morning Slot]**

**A)** straight line whose slope is –1

**B)** straight line whose slope is 1.

**C)** circle whose radius is 1.

**D)** circle whose radius is .

**98)** If , then (1 + iz + z5 + iz8)9 is equal to

**[JEE Main 2019 (Online) 8th April Evening Slot]**

**A)** 1

**B)** –1

**C)** 0

**D)** (-1 + 2i)9

**99)** If and be the roots of the equation x2 – 2x + 2 = 0, then the least value of n for which is :

**[JEE Main 2019 (Online) 8th April Morning Slot]**

**A)** 2

**B)** 5

**C)** 4

**D)** 3

**100)** Let z1 and z2 be two complex numbers satisfying | z1 | = 9 and | z2 – 3 – 4i | = 4. Then the minimum value of  
| z1 – z2 | is :

**[JEE Main 2019 (Online) 12th January Evening Slot]**

**A)** 0

**B)** 1

**C)** 2

**D)**

**101)** If is a purely imaginary number and | z | = 2, then a value of is :

**[JEE Main 2019 (Online) 12th January Morning Slot]**

**A)**

**B)**

**C)** 2

**D)** 1

**102)** Let z be a complex number such that |z| + z = 3 + i (where i = ). Then |z| is equal to

**[JEE Main 2019 (Online) 11th January Evening Slot]**

**A)**

**B)**

**C)**

**D)**

**103)** Let where x and y are real numbers, then y x equals :

**[JEE Main 2019 (Online) 11th January Morning Slot]**

**A)**  85

**B)** 85

**C)**  91

**D)** 91

**104)** Let If R(z) and 1(z) respectively denote the real and imaginary parts of z, then -

**[JEE Main 2019 (Online) 10th January Evening Slot]**

**A)** R(z) = 3

**B)** R(z) < 0 and I(z) > 0

**C)** I(z) = 0

**D)** R(z) > 0 and I(z) > 0

**105)** Let z1 and z2 be any two non-zero complex numbers such that If then -

**[JEE Main 2019 (Online) 10th January Morning Slot]**

**A)**

**B)**

**C)**

**D)** Re(z) 0

**106)** Let z0 be a root of the quadratic equation, x2 + x + 1 = 0, If z = 3 + 6iz081 3iz093, then arg z is equal to :

**[JEE Main 2019 (Online) 9th January Evening Slot]**

**A)**

**B)**

**C)**

**D)** 0

**107)** Let  
  
A =   
  
. Then the sum of the elements in A is :

**[JEE Main 2019 (Online) 9th January Morning Slot]**

**A)**

**B)**

**C)**

**D)**

**108)** Let and be two roots of the equation x2 + 2x + 2 = 0 , then + is equal to :

**[JEE Main 2019 (Online) 9th January Morning Slot]**

**A)** -256

**B)** 512

**C)** -512

**D)** 256

**109)** The least positive integer n for which is :

**[JEE Main 2018 (Online) 16th April Morning Slot]**

**A)** 2

**B)** 3

**C)** 5

**D)** 6

**110)** If |z 3 + 2i| 4 then the difference between the greatest value and the least value of |z| is :

**[JEE Main 2018 (Online) 15th April Evening Slot]**

**A)**

**B)** 8

**C)** 4 +

**D)**

**111)** The set of all R, for which w = is purely imaginary number, for all z C satisfying |z| = 1 and Re z 1, is :

**[JEE Main 2018 (Online) 15th April Morning Slot]**

**A)** an empty set

**B)** {0}

**C)**

**D)** equal to R

**112)** If are the distinct roots of the equation  
  
x2 - x + 1 = 0, then is equal to

**[JEE Main 2018 (Offline)]**

**A)** 2

**B)** -1

**C)** 0

**D)** 1

**113)** Let be a complex number such that 2 + 1 = z where z = . If  
  
  
,  
  
  
then k is equal to

**[JEE Main 2017 (Offline)]**

**A)** z

**B)** -1

**C)** 1

**D)** -z

**114)** The point represented by 2 + *i* in the Argand plane moves 1 unit eastwards, then 2 units northwards and finally from there units in the south-westwardsdirection. Then its new position in the Argand plane is at the point represented by :

**[JEE Main 2016 (Online) 9th April Morning Slot]**

**A)** 2 + 2i

**B)** 1 + i

**C)** 1 i

**D)** 2 2i

**115)** A value of for which is purely imaginary, is :

**[JEE Main 2016 (Offline)]**

**A)**

**B)**

**C)**

**D)**

**116)** A complex number z is said to be unimodular if . Suppose and are complex numbers such that is unimodular and is not unimodular. Then the point lies on a :

**[JEE Main 2015 (Offline)]**

**A)** circle of radius 2.

**B)** circle of radius .

**C)** straight line parallel to x-axis

**D)** straight line parallel to y-axis.

**117)** If z is a complex number such that , then the minimum value of :

**[JEE Main 2014 (Offline)]**

**A)** is strictly greater that

**B)** is strictly greater that but less than

**C)** is equal to

**D)** lie in the interval (1, 2)

**118)** If z is a complex number of unit modulus and argument , then arg equals :

**[JEE Main 2013 (Offline)]**

**A)**

**B)**

**C)**

**D)**

**119)** If and is real, then the point represented by the complex number z lies :

**[AIEEE 2012]**

**A)** either on the real axis or a circle passing through the origin.

**B)** on a circle with centre at the origin

**C)** either on real axis or on a circle not passing through the origin.

**D)** on the imaginary axis.

**120)** If is a cube root of unity, and . Then equals

**[AIEEE 2011]**

**A)** (1 ,1)

**B)** (1, 0)

**C)** (- 1 ,1)

**D)** (0 ,1)

**121)** Let be real and z be a complex number. If has two distinct roots on the line Re z = 1, then it is necessary that :

**[AIEEE 2011]**

**A)**

**B)**

**C)**

**D)**

**122)** The number of complex numbers z such that equals

**[AIEEE 2010]**

**A)** 1

**B)** 2

**C)**

**D)** 0

**123)** Let R be the real line. Consider the following subsets of the plane :  
  
   
  
 ,  
 Which one of the following is true ?

**[AIEEE 2008]**

**A)** Neither S nor T is an equivalence relation on R

**B)** Both S and T are equivalence relation on R

**C)** S is an equivalence relation on R but T is not

**D)** T is an equivalence relation on R but S is not

**124)** The conjugate of a complex number is then that complex number is

**[AIEEE 2008]**

**A)**

**B)**

**C)**

**D)**

**125)** If , then the maximum value of is

**[AIEEE 2007]**

**A)** 6

**B)** 0

**C)** 4

**D)** 10

**126)** The value of is

**[AIEEE 2006]**

**A)** i

**B)** 1

**C)** - 1

**D)** - i

**127)** If , where z is complex number, then value of is

**[AIEEE 2006]**

**A)** 18

**B)** 54

**C)** 6

**D)** 12

**128)** If and are two non-zero complex numbers such that , then arg - arg is equal to

**[AIEEE 2005]**

**A)**

**B)**

**C)** 0

**D)**

**129)** If the cube roots of unity are 1, then the roots of the equation + 8 = 0, are

**[AIEEE 2005]**

**A)**

**B)**

**C)**

**D)**

**130)** If and , then lies on

**[AIEEE 2005]**

**A)** an ellipse

**B)** a circle

**C)** a straight line

**D)** a parabola

**131)** If , then z lies on

**[AIEEE 2004]**

**A)** an ellipse

**B)** the imaginary axis

**C)** a circle

**D)** the real axis

**132)** If and , then   
  
  
 is equal to

**[AIEEE 2004]**

**A)** - 2

**B)** - 1

**C)** 2

**D)** 1

**133)** Let z and w be complex numbers such that and arg zw = . Then arg z equals

**[AIEEE 2004]**

**A)**

**B)**

**C)**

**D)**

**134)** If then

**[AIEEE 2003]**

**A)** x = 2n + 1, where n is any positive integer

**B)** x = 4n , where n is any positive integer

**C)** x = 2n, where n is any positive integer

**D)** x = 4n + 1, where n is any positive integer.

**135)** Let and be two roots of the equation , Z being complex. Further , assume that the origin, and form an equilateral triangle. Then

**[AIEEE 2003]**

**A)**

**B)**

**C)**

**D)**

**136)** If and are two non-zero complex numbers such that and then is equal to

**[AIEEE 2003]**

**A)**

**B)** 1

**C)** - 1

**D)**

**137)** The locus of the centre of a circle which touches the circle and externally   
  
  
( are complex numbers) will be

**[AIEEE 2002]**

**A)** an ellipse

**B)** a hyperbola

**C)** a circle

**D)** none of these

**138)** If , its solution is given by

**[AIEEE 2002]**

**A)**

**B)**

**C)**

**D)**

**139)** z and w are two nonzero complex numbers such that and Arg z + Arg w = then z equals

**[AIEEE 2002]**

**A)**

**B)**

**C)**

**D)**