**MATHEMATICS**

**PAGEMAKER10**

**LEVEL-I**

Q1. . is

(a)

(b)

(c)

(d) none

L1Difficulty1

Qtag Mathematics

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Q2. n is positive integer, then which of the following relation is false.

(a)

(b)

(c)

(d) 1

L1Difficulty1

Qtag Mathematics

Qcreator Pagemaker10

Q3. If (1 – i)n = 2n then, n is

(a) 1

(b) 0

(c) –1

(d) none

L1Difficulty1

Qtag Mathematics

Qcreator Pagemaker10

Q4. The imaginary part of ii is

(a) 0

(b) 1

(c) 2

(d) –1

L1Difficulty1

Qtag Mathematics

Qcreator Pagemaker10

Q5. If Z1 and Z2 be two complex No., then Re(Z1 Z2) is

(a) ReZ1.ReZ2

(b) Re(Z1).ImZ2

(c) imZ1.ReZ2

(d) none

L1Difficulty1

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Q6. If z 0 is a complex No., then

(a) Re(Z) = 0 = im(Z2) = 0

(b) Re(Z2) = 0 imZ2 = 0

(c) ReZ = 0 ReZ2 = 0

(d) none

L1Difficulty1

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Q7. If (a + bi) (c + id) (e + if) = A + iB

(a) A2 + B2

(b) A2 – B2

(c) A2

(d) B2

L1Difficulty1

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Q8. Conjugate of complex No. is

(a)

(b)

(c)

(d)

L1Difficulty1

Qtag Mathematics

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Q9. , where a isreal is

(a)

(b) |

(c)

(d) none

L1Difficulty1

Qtag Mathematics

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Q10. is if z = x + iy

(a)

(b)

(c)

(d)

L1Difficulty1

Qtag Mathematics

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**Solutions**

S1. Ans. (b)

Sol.

.

 =

S2. Ans. (b)

Sol.

d

S3. Ans. (d)

Sol.

(1 – i)n = 2n

|1 – i|n = |2n|

 = 2n

 = 2n

 = n

only at n = 0

S4. Ans. (b)

Sol.

|i|i

 1

S5. Ans. (a)

Sol.

Z1 Z2 = (x1 + iy1) (x2 + iy2)

= x1x2 – y1y2 + ix1y2 + ix2y

S6. Ans. (a)

Sol.

Z2 = x2 – y2 + 2ixy

ReZ = 0 x = 0 therefore

ImZ2 = 2xy = 0

S7. Ans. (a)

Sol.

 =

(a2 + b2) (c2 + d2) (e2 + f2) = A2 + B2

S8. Ans. (b)

Sol.

 =

S9. Ans. (c)

Sol.

(z + a) ( + a)

( + a) (z + a)

S10. Ans. (a)

Sol.

**LEVEL-II**

Q1. the maximum value of is

(a)

(b)

(c)

(d)

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q2. Let z be a complex No. (Not lying on x-axis of maximum modulus such that

(a) Im(z) = 0

(b) Rez = 0

(c) ampz =

(d) none

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q3. If z1, z2 are two complex No. then

 is

(a)

(b)

(c)

(d)

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q4. A real value of x will satisfy the equation = if

(a)

(b)

(c)

(d)

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q5. Which one is false

(a)

(b)

(c) =

(d) argz = arg

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q6. If arg(z) = , then arg is

(a)

(b)

(c)

(d)

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q7. The amplitude of the complex No. z = Sin + i(1 – Cos )

(a) 2Sin

(b)

(c)

(d) none

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q8. If = Cos + i Sin, then in ABC value of is

(a) –i

(b) 1

(c) –1

(d) none

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q9. If y = Cos + i Sin, then is

(a) 2 Cos

(b) 2Sin

(c) 2Cosec

(d) 2tan

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

Q10. The imaginary part of tan–1

(a) 0

(b)

(c) log2

(d) log4

L3Difficulty3

Qtag Mathematics

Qcreator Pagemaker10

**Solutions**

S1. Ans. (b)

Sol.

=2

S2. Ans. (b)

Sol.

(Cos

Since is maximum

therefore = 0

Differentiate w.r.t.

2r

 0

Re Z = 0

S3. Ans. (d)

Sol.

Let z1 = 1 + 0i

and z2 = 0 + i

S4. Ans. (c)

Sol.

 taking modules and squaring on both side

S5. Ans. (d)

Sol.

argz = ten–1 , arg = ten–1

argz arg

S6. Ans. (b)

Sol.

z = a + ib

 = ten–1

 = a – ib

 = tan–1 = tan–1

 =

S7. Ans. (b)

Sol.

z = Sin + i(1 – Cos )

z = 2Sin .Cos + i2Sin2

z = 2Sin

S8. Ans. (c)

Sol.

e+i (A + B + C)

–1

S9. Ans. (a)

Sol.

y = =

y + = 2 Cos

S10. Ans.

Sol.

i tan = log

= log2

**LEVEL-III**

Q1. If then the points represent the complex No. –1 + 5z will be

(a) circle

(b) straight line

(c) parabola

(d) none

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q2. A rectangle is constructed in the complex plane with its sides parallel to the axes and its centre is situated at the origin. If one of the vertices of he rectangle is a + ib then the area of the rectangle is

(a) ab

(b) 2ab

(c) 3ab

(d) 4ab

L5Difficulty5

Qtag Mathematics

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Q3. If represented a circle, then its radius is

(a) 1

(b)

(c)

(d)

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q4. If z2 + z + 1 = 0 where z is a complex No. then the value of ...................

(a) 18

(b) 54

(c) 6

(d) 12

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q5. is equal to

(a) Cos – i Sin

(b) Cos 9 – i Sin 9

(c) Sin – i Cos

(d) Sin 9 – i Cos 9

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q6. Let z = Cos then the value of (z2m–1) at is

(a)

(b)

(c)

(d)

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q7. If and , then all the values of lie on.

(a) a line not passing throughout origin

(b)

(c) the x – axis

(d) y – axis

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q8. If = , where and satisfies the condition that is purely real, then the let of values of z is

(a) =1}

(b)

(c)

(d)

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q9. Let z be a complex No. such that the imaginary part of z is non-zero and a a = z2 + z + 1 is real then a cannot take the value

(a) –1

(b)

(c)

(d)

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

Q10. If and = the Re () is

(a) 0

(b)

(c)

(d)

L5Difficulty5

Qtag Mathematics

Qcreator Pagemaker10

**Solutions**

S1. Ans. (a)

Sol.

Let = –1 + 5z

the + 1 = 5z

|

 lies on a circle.

S2. Ans. (d)

Sol.

Area of required = 4 × area of OABC

= 4 × a × b = 4ab



S3. Ans. (d)

Sol.

z = x + iy

x2 + y2 – x + = 0

radius =

S4. Ans. (d)

Sol.

z2 + z + 1 = 0

z = w

....................

1 + 1 + 4 + 1 + 1 + 4 = 12

S5. Ans. (d)

Sol.

=

=

=

=

S6. Ans. (d)

Sol.

x = Sin + Sin3 + ................ +Sin29

2Sin x = 1 – Cos2 + Cos2 – Cos4 + ................ Cos28 – Cos30

x =

S7. Ans. (d)

Sol.

E = = = which is imaginary.

S8. Ans. (d)

Sol.

(z – 1) ( = 0 z = 1

S9. Ans. (d)

Sol.

z2 + z + 1 – a = 0

clearly this equation do not have real roots if D < 0

1 – 4 (1 – a) < 0

4a < 3

a <

S10. Ans. (a)

Sol.

arg = ±

 is purely imaginary

Re () = 0

