kd education academy (9582701166

Time : 10 Hour | STD 11 Maths | Total Marks : 222

kd90+ ch- 4 complex numbers and quadratic equations

* **Match the following.** **[5]**

1.

Part (a)	Part (b)
1. Value of $(1+i)(1+i^2)(1+i^3)(1+i^4)$	(a) 0
2. $a=1+i$ then value of a^2	(b) $-i$
3. Square root of $-i$	(c) $2i$
4. i^{135}	(d) $\pm\frac{1}{\sqrt{2}}(1-i)$
5. i^{-999}	(e) i

* **Choose the right answer from the given options. [1 Marks Each]** **[52]**

2. If $\mathrm{i}^2=-1$, then the sum $\mathrm{i}+\mathrm{i}^2+\mathrm{i}^3+\ldots$ upto 1000 terms is equal to:

(A) 1 (B) -1 (C) i (D) 0

3. If, $x^4 + 4x^3 + 6ax^2 + 6bx + c$ is divisible by $x^3 + 3x^2 + 9x + 3$. Then, what is the value of a + b + c ?

(A) 4 (B) 6 (C) 7 (D) 10

4. If p and q are the roots of the equation $x^2 + px + q = 0$ then, what are the values of p and q?

(A) p = 1, q = -2 (B) p = 0, q = 1 (C) p = -2, q = 0 (D) p = -2, q = 1

5. A real value of *x* satisfies the equation $\frac{3-4\mathrm{ix}}{3+4\mathrm{ix}}=\mathrm{a}-\mathrm{ib}\left(\mathrm{a},\mathrm{b}\in\mathrm{R}\right)$, if $\mathrm{a}^2+\mathrm{b}^2=$

(A) 1 (B) -1 (C) 2 (D) -2

6. If $x^2 + px + 1 = 0$ and $(a - b)x^2 + (b - c)x + (c - a) = 0$ have both roots common, then what is the form of a, b, c?

(A) a, b, c are in A.P (B) b, a, c are in A.P (C) b, a, c are in G.P (D) b, a, c are in H.P

7. If $\mathrm{i}^2=-1$, then the sum $\mathrm{i}+\mathrm{i}^2+\mathrm{i}^3+\ldots$ upto 1000 terms is equal to:

(A) 1 (B) -1 (C) i (D) 0

8. According to De Moivre’s theorem what is the value of $\mathrm{z}^{\frac{1}{\mathrm{n}}}$

(A) $\mathrm{r}^{\frac{1}{\mathrm{n}}}\left[\cos 2\mathrm{kn}+\theta)+\mathrm{i}\sin(2\mathrm{kn}+\theta)\right]$

(B) $\mathrm{r}^{\frac{1}{\mathrm{n}}}\left[\frac{\cos 2\mathrm{kn}+\theta)}{\mathrm{n}}-\frac{\mathrm{i}\sin(2\mathrm{kn}+\theta)}{\mathrm{n}}\right]$

(C) $\mathrm{r}^{\frac{1}{\mathrm{n}}}\left[\frac{\cos 2\mathrm{kn}+\theta)}{\mathrm{n}}+\frac{\mathrm{i}\sin(2\mathrm{kn}+\theta)}{\mathrm{n}}\right]$

(D) $\mathrm{r}^{\frac{1}{\mathrm{n}}}\left[\cos 2\mathrm{kn}+\theta)-\mathrm{i}\sin(2\mathrm{kn}+\theta)\right]$

9. If $\frac{1-ix}{1+ix} = a + ib$, then $a^2 + b^2 =$

(A) 1 (B) -1 (C) 0 (D) none of these

10. Find mirror image of point representing x + i y on real axis:

(A) (x, y) (B) (-x, -y) (C) (-x, y) (D) (x, -y)

11. If $(1+i)(1+2i)(1+3i)\ldots(1+ni) = a+ib$, then 2.5.10.17...$(1+n^2) =$

(A) $a - ib$ (B) $a^2 - b^2$ (C) $a^2 + b^2$ (D) none of these

12. The value of $(1+i)(1+i^2)(1+i^3)(1+i^4)$ is

(A) 2 (B) 0 (C) 1 (D) i

13. The square root of (- 15 – 8i) is:

(A) $\pm(1-4i)$ (B) $\pm(1+4i)$ (C) $\pm(-2+4i)$ (D) None of these

14. If $\frac{3+2i\sin\theta}{1-2i\sin\theta}$ is a real number and $0 < \theta < 2\pi$, then $\theta =$

(A) π (B) $\frac{\pi}{2}$ (C) $\frac{\pi}{3}$ (D) $\frac{\pi}{6}$

15. If, α and β are the roots of the equation $2x^2 - 3x - 6 = 0$, then what is the equation whose roots are $a^2 + 2$ and $\beta^2 + 2$

(A) $4x^2 + 49x + 118 = 0$ (B) $4x^2 - 49x + 118 = 0$ (C) $4x^2 - 49x - 118 = 0$ (D) $x^2 - 49x + 118 = 0$

16. If $x + iy = (1+i)(1+2i)(1+3i)$, then $x^2 + y^2 =$

(A) 0 (B) 1 (C) 100 (D) none of these

17. If, $(a+1)x^2 + 2(a+1)x + (a-2) = 0$ then, for what parameter of 'a' the given equation have real and distinct roots?

(A) $(-\infty, \infty)$ (B) $(-1, \infty)$ (C) $[-1, \infty)$ (D) $(-1, 1)$

18. If $z = 1 - \cos\theta + i\sin\theta$, then $|z| =$

(A) $2\sin\frac{\theta}{2}$ (B) $2\cos\frac{\theta}{2}$ (C) $2\left|\sin\frac{\theta}{2}\right|$ (D) $2\left|\cos\frac{\theta}{2}\right|$

19. If one root of the equation $x^2 + px + 12 = 0$, is 4, while the equation $x^2 + px + q = 0$ has equal roots, the value of q is:

(A) $\frac{49}{4}$ (B) $\frac{4}{49}$ (C) 4 (D) None of these.

20. If z = 2 - 3i then $z^2 - 4z + 13 =$

(A) 0 (B) 1 (C) 2 (D) 3

21. The complex number z which satisfies the condition $\left|\frac{i+z}{i-z}\right| = 1$ lies on:

(A) Circle $x^2 + y^2 = 1$ (B) The x-axis (C) The y-axis (D) The line x + y = 1

22. If $a = \cos\theta + i\sin\theta$, then $\frac{1+a}{1-a} =$

(A) $\cot\frac{\theta}{2}$ (B) $\cot\theta$ (C) $i\cot\frac{\theta}{2}$ (D) $i\tan\frac{\theta}{2}$

23. The argument of $\frac{1-i\sqrt{3}}{1+i\sqrt{3}}$ is:

(A) 60° (B) 120° (C) 210° (D) 240°

24. If, $(a+1)x^2+2(a+1)x+a-2=0$ then, for what parameter of 'a' the given equation have equal roots?

(A) $\left(-\infty,-1\right)$ (B) $\left[-1,\infty\right)$ (C) $\left(0,1\right)$ (D) Not possible

25. Choose the correct answer.

$\sin x+i\cos 2x$ and $\cos x-i\sin 2x$ are conjugate to each other for:

(A) $x=n\pi$ (B) $x=\left(n+\frac{1}{2}\right)\frac{\pi}{2}$ (C) $x=0$ (D) no value of x

26. Convert -1 + i into polar form:

(A) $\sqrt{2},\frac{5\pi}{4}$ (B) $\sqrt{2},\frac{3\pi}{4}$ (C) $-\sqrt{2},\frac{\pi}{4}$ (D) $\sqrt{2},\frac{\pi}{4}$

27. Choose the correct answer.

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.

28. A quadratic equation $ax^2 + bx + c = 0$ has two distinct real roots, if

(A) a = 0 (B) $b^2 - 4ac = 0$ (C) $b^2 - 4ac < 0$ (D) $b^2 - 4ac > 0$

29. The number of real roots of the equation $(x^2 + 2x)^2 - (x + 1)^2 - 55 = 0$:

(A) 2 (B) 1 (C) 4 (D) None of these.

30. The polar form of $(i^{25})^3$ is:

(A) $\cos\frac{\pi}{2}+i\sin\frac{\pi}{2}$ (B) $\cos\pi+i\sin\pi$ (C) $\cos\pi-i\sin\pi$ (D) $\cos\frac{\pi}{2}-i\sin\frac{\pi}{2}$

31. What will be the sum of b + c if the equations $x^2 + bx + c = 0$ and $x^2 + 3x + 3 = 0$ have one common root:

(A) 2 (B) 4 (C) 6 (D) 8

32. Choose the correct answer.

The real value of α for which the expression $\frac{1-i\sin\alpha}{1+2i\sin\alpha}$ is purely real is:

(A) $(n+1)\frac{\pi}{2}$ (B) $(2n+1)\frac{\pi}{2}$

(C) $n\pi$ (D) None of these, where $n\in N$

33. If $z_1 = 2 + 3i$ and $z_2 = 5 + 2i$, then find sum of two complex numbers:

(A) 4 + 8i (B) 3 - i (C) 7 + 5i (D) 7 - 5i

34. Choose the correct answer.

The real value of θ for which the expression $\frac{1+i\cos\theta}{1-2i\cos\theta}$ is a real number is:

(A) $n\pi+\frac{\pi}{4}$ (B) $n\pi+(-1)^n\frac{\pi}{4}$ (C) $2n\pi\pm\frac{\pi}{2}$ (D) None of these.

35. If $z = \left(\frac{1+i}{1-i}\right)$, then z^4 equals:

(A) 1 (B) -1 (C) 0 (D) none of these.

36. What is the number of solution(s) of the equation $|\sqrt{x-2}| + \sqrt{x(\sqrt{x-4})} + 2 = 0$

(A) 2 (B) 4

(C) No solution (D) Infinitely many solutions

37. $\frac{1+2i+3i^2}{1-2i+3i^2}$ equals:

(A) i (B) -1 (C) -i (D) 4

38. The value of $(1+i)^4 + (1-i)^4$ is:

(A) 8 (B) 4 (C) -8 (D) -4

39. Choose the correct answer.

A real value of x satisfies the equation $\left(\frac{3-4ix}{3+4ix}\right) = \alpha - i\beta (\alpha, \beta \in R)$ if $\alpha^2 + \beta^2 =$

(A) 1 (B) -1 (C) 2 (D) -2

40. Solve $\sqrt{3x^2} + x + \sqrt{3} = 0$

(A) $\frac{-1 \pm i\sqrt{11}}{6\sqrt{3}}$ (B) $\frac{1 \pm i\sqrt{11}}{6\sqrt{3}}$ (C) $\frac{1 \pm \sqrt{11}}{6\sqrt{3}}$ (D) $\frac{-1 \pm \sqrt{11}}{6\sqrt{3}}$

41. If $\frac{1+7i}{(2-i)^2}$, then:

(A) $|z| = 2$ (B) $|z| = \frac{1}{2}$ (C) $\mathrm{amp}(z) = \frac{\pi}{4}$ (D) $\mathrm{amp}(z) = \frac{3\pi}{4}$

42. If α, β are the roots of the equation $x^2 - p(x + 1) - c = 0$, then $(\alpha + 1)(\beta + 1) =$

(A) c (B) c - 1 (C) 1 - c (D) None of these.

43. If $(x+iy)^{\frac{1}{3}} = a + ib$, then $\frac{x}{a} + \frac{y}{b} =$

(A) 0 (B) 1 (C) -1 (D) none of these

44. If $\alpha\beta$ are the roots of the equation $x^2 + px + q = 0$ then $-\frac{1}{\alpha} + \frac{1}{\beta}$ are the roots of the equation:

(A) $x^2 - px + q = 0$ (B) $x^2 + px + q = 0$ (C) $qx^2 + px + 1 = 0$ (D) $qx^2 - px + 1 = 0$

45. The number of roots of the equation $\frac{(x+2)(x-5)}{(x+3)(x+6)} = \frac{x-2}{x+4}$ is:

(A) 0 (B) 1 (C) 2 (D) 3

46. If α, β are the roots of the equation x2 + px + 1 = 0; γ, δ the roots of the equation $x^2 + qx + 1 = 0$, then $(\alpha - \gamma)(\alpha + \delta)(\beta - \delta)(\beta + \delta) =$

(A) $q^2 - p^2$ (B) $p^2 - q^2$ (C) $p^2 + q^2$ (D) None of these.

47. The least positive integer n such that $\left(\frac{2i}{1+i}\right)^n$ is a positive integer, is:

(A) 16 (B) 8 (C) 4 (D) 2

48. Solve $2x^2+\sqrt{2x+2}=0$

(A) $\frac{-1\pm i\sqrt{7}}{2\sqrt{2}}$ (B) $\frac{1\pm i\sqrt{7}}{2\sqrt{2}}$ (C) $\frac{1\pm\sqrt{7}}{2\sqrt{2}}$ (D) $\frac{-1\pm\sqrt{7}}{2\sqrt{2}}$

49. The value of $\frac{i^{592}+i^{590}+i^{588}+i^{586}+i^{584}}{i^{582}+i^{580}+i^{578}+i^{576}+i^{574}}-1$ is

(A) -1 (B) -2 (C) -3 (D) -4

50. The value of $\frac{(i^5+i^6+i^7+i^8+i^9)}{(1+i)}$ is:

(A) $\frac{1}{2}(1+i)$ (B) $\frac{1}{2}(1-i)$ (C) 1 (D) $\frac{1}{2}$

51. If $z=\cos\frac{\pi}{4}+i\sin\frac{\pi}{6}$, then

(A) $|z|=1, \arg(z)=\frac{\pi}{4}$ (B) $|z|=1, \arg(z)=\frac{\pi}{6}$

(C) $|z|=\frac{\sqrt{3}}{2}, \arg(z)=\frac{5\pi}{24}$ (D) $|z|=\frac{\sqrt{3}}{2}, \arg(z)=\tan^{-1}\frac{1}{\sqrt{2}}$

52. The number of real solutions of $|2x-x^2-3|=1$ is:

(A) 0 (B) 2 (C) 3 (D) 4

53. If α and β are imaginary cube roots of unity, then the value of $\alpha^4+\beta^{28}+\frac{1}{\alpha\beta}$ is:

(A) 1 (B) -1 (C) 0 (D) None of these

*** Given section consists of questions of 2 marks each.** **[54]**

54. Express the complex number $\left(-2-\frac{1}{3}i\right)^3$ in the form of a + ib.

55. Find the multiplicative inverse of the complex numbers $=\sqrt{5}+3i$

56. Express the following in the form of a + ib.

$\frac{(3+\sqrt{5}i)(3-\sqrt{5}i)}{(\sqrt{3}+\sqrt{2}i)-(\sqrt{3}-\sqrt{2}i)}$

57. Find the modulus of $\frac{1+i}{1-i}-\frac{1-i}{1+i}$.

58. Find the number of non-zero integral solutions of the equation $|1-i|^x=2^x$.

59. If (a + ib) (c + id) (e+ if) (g + ih) = A + iB then show that

$(a^2+b^2)(c^2+d^2)(e^2+f^2)(g^2+h^2)=A^2+B^2$

60. If $\left(\frac{1+i}{1-i}\right)^m=1$ then find the least positive integral value of m.

61. Express $(5-3i)^3$ in the form a + ib.

62. Represent the complex number z = 1 + $i\sqrt{3}$ in the polar form.

63. Convert the complex number $\frac{-16}{1+\sqrt{3}i}$ into polar form.

64. Solve $\sqrt{5}x^2+x+\sqrt{5}=0$

65. Find the conjugate of $\frac{(3-2i)(2+3i)}{(1+2i)(2-i)}$

66. Evaluate the following:
i^{528}

67. Find the square root of the following complex numbers:
$4\mathrm{i}$

68. Evaluate the following:
$\mathrm{i}^{30}+\mathrm{i}^{40}+\mathrm{i}^{60}$

69. Evaluate the following:
$\mathrm{i}^{49}+\mathrm{i}^{68}+\mathrm{i}^{89}+\mathrm{i}^{110}$

70. Express the following complex numbers in the standard form a + ib:
$\left(\frac{1}{1-4\mathrm{i}}-\frac{2}{1+\mathrm{i}}\right)\left(\frac{3-4\mathrm{i}}{5+\mathrm{i}}\right)$

71. If Z_1, z_2, z_3 are complex numbers such that $|\mathrm{z}_1|=|\mathrm{z}_2|=|\mathrm{z}_3|=\left|\frac{1}{\mathrm{z}_1}+\frac{1}{\mathrm{z}_2}+\frac{1}{\mathrm{z}_3}\right|=1,$ then find the value of $|\mathrm{z}_1+\mathrm{z}_2+\mathrm{z}_3|$.

72. Express the following complex numbers in the standard form a + ib:
$\frac{(1-\mathrm{i})^3}{1-\mathrm{i}^3}$

73. Find the number of solutions of $\mathrm{z}^2+|\mathrm{z}|^2=0$.

74. Show the following quadratic equation by factorization method:
$27x^2 - 10x + 1 = 0$

75. Show the following quadratic equation:
$x^2 - (2 + i) x - (1 - 7i) = 0$

76. Show the following quadratic equation:
$\mathrm{x}^2-(3\sqrt{2}+2\mathrm{i})\mathrm{x}+6\sqrt{2}\,\mathrm{i}=0$

77. Show the following quadratic equation:
$(2 + i) x^2 - (5 - i) x + 2 (1 - i) = 0$

78. Show the following quadratic equation by factorization method:
$\mathrm{x}^2-(2\sqrt{3}+3\mathrm{i}))\mathrm{x}+6\sqrt{3}\,\mathrm{i}=0$

79. If $\left(\frac{1+\mathrm{i}}{1-\mathrm{i}}\right)^3-\left(\frac{1-\mathrm{i}}{1+\mathrm{i}}\right)^3=\mathrm{x}+\mathrm{i}\mathrm{y},$ then find (x, y).

80. Find the value of the following :
$(1+i)^8+(1-i)^8$

*** Given section consists of questions of 3 marks each.** **[48]**

81. Evaluate $\left[i^{18}+\left(\frac{1}{i}\right)^{25}\right]^3$

82. Reduce $\left(\frac{1}{1-4i}-\frac{2}{1+i}\right)\left(\frac{3-4i}{5+i}\right)$ to the standard form.

83. If $x-iy=\sqrt{\frac{a-ib}{c-id}}$ prove that $(x^2+y^2)^2=\frac{a^2+b^2}{c^2+d^2}$

84. Convert in the polar form: $\frac{1+7i}{(2-i)^2}$

85. If a + ib $=\frac{(x+i)^2}{2x^2+1}$, prove that $a^2+b^2=\frac{(x^2+1)^2}{(2x^2+1)^2}$.

86. If $(x + iy)^3 = u + iv$, then show that $\frac{u}{x}+\frac{v}{y}=4(x^2-y^2)$

87. If α and β are different complex numbers with $|\beta|=1$ then find $\left|\frac{\beta-\alpha}{1-\bar{\alpha}\beta}\right|$

88. Express $\frac{5+\sqrt{2}i}{1-\sqrt{2}i}$ in the form of a + ib.

89. If x + iy = $\frac{a+ib}{a-ib}$, prove that $x^2 + y^2 = 1$

90. Write the complex number z = $\frac{i-1}{\cos\frac{\pi}{3}+i\sin\frac{\pi}{3}}$ in the polar form.

91. $(1+\mathrm{i})^6+(1-\mathrm{i})^3$

92. Find the values of the following expressions:
$\mathrm{i}^{30}+\mathrm{i}^{80}+\mathrm{i}^{120}$

93. Show the following quadratic equation by factorization method:
$\sqrt{2}\mathrm{x}^2+\mathrm{x}+\sqrt{2}=0$

94. Show the following quadratic equation:
$ix^2 - x + 12i = 0$

95. If $\frac{(1+\mathrm{i})^2}{2-\mathrm{i}}=\mathrm{x}+\mathrm{iy},$ then find the value of x + y.

96. If $\frac{(\mathrm{a}^2+1)^2}{2\mathrm{a}-\mathrm{i}}=\mathrm{x}+\mathrm{iy},$ what is the value of $x^2 + y^2$?

*** Given section consists of questions of 5 marks each.** **[55]**

97. Express the following complex numbers in the form $\mathrm{r}(\cos\theta+\mathrm{i}\sin\theta)$:
$1-\sin\alpha+\mathrm{i}\cos\alpha$

98. Find the least positive integral value of n for which $\left(\frac{1+\mathrm{i}}{1-\mathrm{i}}\right)^{\mathrm{n}}$ is real.

99. Evaluate the following:
$2\mathrm{x}^3+2\mathrm{x}^2-7\mathrm{x}+72,$ when $\mathrm{x}=\frac{3-5\mathrm{i}}{2}$

100. $\mathrm{x}^4+4\mathrm{x}^3+6\mathrm{x}^2+4\mathrm{x}+9,$ when $\mathrm{x}=-1+\mathrm{i}\sqrt{2}$

101. Express the following complex numbers in the form $\mathrm{r}(\cos\theta+\mathrm{i}\sin\theta)$:
$\tan\alpha-\mathrm{i}$

102. $2\mathrm{x}^4+5\mathrm{x}^3+7\mathrm{x}^2-\mathrm{x}+41,$ when $\mathrm{x}=-2-\sqrt{3}\mathrm{i}$

103. For a positive integer n, find the value of $(1-\mathrm{i})^{\mathrm{n}}\left(1-\frac{1}{\mathrm{i}}\right)^{\mathrm{i}}$.

104. Express the following complex numbers in the form $\mathrm{r}(\cos\theta+\mathrm{i}\sin\theta)$:
$1+\mathrm{i}\tan\alpha$

105. Evaluate the following:
$\mathrm{x}^4-4\mathrm{x}^3+4\mathrm{x}^2+8\mathrm{x}+44,$ when $\mathrm{x}=3+2\mathrm{i}$

106. If $\left(\frac{1-\mathrm{i}}{1+\mathrm{i}}\right)^{100}=\mathrm{a}+\mathrm{ib},$ find (a, b).

107. If $\mathrm{a}=\cos\theta+\mathrm{i}\sin\theta,$ find the value of $\left(\frac{1+\mathrm{a}}{1-\mathrm{a}}\right)$

*** Case study based questions** **[8]**

108. A complex number z is pure real if and only if $\bar{z}=z$ and is pure imaginary if and only if $\bar{z}=-z$.
Based on the above information, answer the following questions.

(i) If $(1+i)z=(1-i)\bar{z}$, then $-i\bar{z}$ is
(a) $-\bar{z}$ (b) z (c) $\bar{z}$ (d) z^{-1}

(ii) $\overline{Z_1Z_2}$ is
(a) $\bar{z}_1\bar{z}_2$ (b) $\bar{z}_1+\bar{z}_2$ (c) $\frac{z_1}{z_2}$ (d) $\frac{1}{z_1z_2}$

(iii) If x and y are real numbers and the complex number $\frac{(2+i)x-i}{4+i}+\frac{(1-i)y+2i}{4i}$ is pure real, the relation between x and y is
(a) $8x-17y=16$ (b) $8x+17y=16$
(c) $17x-8y=16$ (d) $17x-8y=-16$

(iv) If $z=\frac{3+2i\sin\theta}{1-2i\sin\theta}\left(0<\theta\leq\frac{\pi}{2}\right)$ is pure imaginary, then θ is equal to
(a) $\frac{\pi}{4}$ (b) $\frac{4}{6}$ (c) $\frac{6}{3}$ (d) $\frac{\pi}{12}$

(v) If z_1 and z_2 are complex numbers such that $\left|\frac{z_1-z_2}{z_1+z_2}\right|=1$
(a) $\frac{z_1}{z_2}$ is pure real (b) $\frac{z_1}{z_2}$ is pure imaginary
(c) z_1 is pure real (d) z_1 and z_2 are pure imaginary

109. We have, $i=\sqrt{-1}$. So, we can write the higher powers of i as follows
(i) $i^2=-1$
(ii) $i^3=i^2\cdot i=(-1)\cdot i=-i$
(iii) $i^4=\left(i^2\right)^2=(-1)^2=1$
(iv) $i^5=i^{4+1}=i^4\cdot i=1\cdot i=i$
(v) $i^6=i^{4+2}=i^4\cdot i^2=1\cdot i^2=-1$

In order to compute i^n for $n > 4$, write $i^n = i^{4q+r}$ for some $q, r \in N$ and $0 \le r \le 3$.
Then, $i^n = i^{4q} \cdot i^r = \left(i^4\right)^q \cdot i^r = (1)^q \cdot i^r = i^r$.
In general, for any integer $k, i^{4k} = 1, i^{4k+1} = i, i^{4k+2} = -1$ and $i^{4k+3} = -i$.

On the basis of above information, answer the following questions.

(i) The value of i^{37} is equal to
(a) i (b) $-i$ (c) 1 (d) -1

(ii) The value of i^{-30} is equal to
(a) i (b) 1 (c) -1 (d) $-i$

(iii) If $z = i^9 + i^{19}$, then z is equal to
(a) $0+0i$ (b) $1+0i$ (c) $0+i$ (d) $1+2i$

(iv) The value of $\left[i^{19} + \left(\frac{1}{i}\right)^{25}\right]^2$ is equal to
(a) -4 (b) 4 (c) i (d) 1

(v) If $z = i^{-39}$, then simplest form of z is equal to
(a) $1+0i$ (b) $0+i$ (c) $0+0i$ (d) $1+i$

----- “The only one who can tell you 'you can't win' is you, and you don't have to listen.” -----