**ACTIVE SITE TUTORIALS**

**Date :** 24-07-2019 **TEST ID: 209**

**Time :** 34:36:00 **MATHEMATICS**

**Marks :** 4152

5.COMPLEX NUMBERS AND QUADRATIC EQUATIONS

**Single Correct Answer Type**

| 1. | The modulus of is | | | | | | | |
|  | a) | unit | b) | unit | c) | unit | d) | unit |
| 2. | If then is equal to | | | | | | | |
|  | a) | 0 | b) | 1 | c) |  | d) | 2 |
| 3. | The area of the triangle formed by the points representing and in the Argand plane is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 4. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 5. | Let and be affixes of two points and the argand plane and represents the complex number Then, the locus of if is | | | | | | | |
|  | a) | Circle on as diameter | | | | | | | |
|  | b) | The line | | | | | | | |
|  | c) | The perpendicular bisector of | | | | | | | |
|  | d) | None of these | | | | | | | |
| 6. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) | None of these |
| 7. | Given if | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 8. | The expression is real iff | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 9. | If are positive and are in AP, then roots of the quadratic equation are complex for | | | | | | | |
|  | a) |  | b) |  | c) | All and | d) | No and |
| 10. | If the roots of the equation are equal in magnitude but opposite in sign, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 11. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 12. | In writing an equation of the form the coefficient of is written incorrectly and roots are found to be equal. Again in writing the same equation the constant term is written incorrectly and it is found that one root is equal to those of the previous wrong equation while the other is double of it. If be the roots of correct equation, then is equal to | | | | | | | |
|  | a) | 5 | b) | 5 | c) |  | d) |  |
| 13. | If is complex, the expression takes all which lie in the interval where | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 14. | Let be real, if has two real roots and , where and , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 15. | Two students while solving a quadratic equation in one copied the constant term incorrectly and got the roots 3 and 2. The other copied the constant term coefficient of correctly as and 1 respectively the correct roots are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 16. | , if is a root of , if are the roots of .  Which of the following is true? | | | | | | | |
|  | a) | is true, is true | | | b) | is true, is false | | |
|  | c) | is false is true | | | d) | is false, is false | | |
| 17. | If , then is | | | | | | | |
|  | a) | 16 | b) | -16 | c) |  | d) |  |
| 18. | If , then is equal to | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) |  |
| 19. | The least value of | for which and cot are roots of the equation , is | | | | | | | |
|  | a) | 2 | b) | 1 | c) |  | d) | 0 |
| 20. | If 1, 2, 3 and 4 are the roots of the equation , then is equal to | | | | | | | |
|  | a) | -25 | b) | 0 | c) | 10 | d) | 24 |
| 21. | The number of integral solutions of is | | | | | | | |
|  | a) | 2 | b) | 3 | c) | 4 | d) | 5 |
| 22. | If one root of the equation be double the other and if then the greatest value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 23. | The argument of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 24. | If the area of the triangle on the complex plane formed by the points , and is 200, then the value of must be equal to | | | | | | | |
|  | a) | 20 | b) | 40 | c) | 60 | d) | 80 |
| 25. | If the roots of the equation be imaginary, then for all real values of , the expression is | | | | | | | |
|  | a) | Greater than | b) | Less than | c) | Greater than | d) | Less than |
| 26. | If is a rational function of is negative, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 27. | If is a positive integer, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 28. | The points represented by the complex numbers on the argand diagram are | | | | | | | |
|  | a) | Vertices of an equilateral triangle | | | b) | Vertices of an isosceles triangle | | |
|  | c) | Collinear | | | d) | None of the above | | |
| 29. | If the amplitude of is , then the locus of , is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 30. | The value of  is | | | | | | | |
|  | a) | 0 | b) | -1 | c) |  | d) | 1 |
| 31. | Let be the roots of Then the equation whose roots are and is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 32. | The vector is turned counterclockwise through an angle of and stretched times. The complex number corresponding to newly obtained vector is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 33. | If , then the complex number is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 34. | For real values of the expression will assume all real values provided | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 35. | If is a factor of then the other factor is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 36. | The centre of a square is at the origin and is one of its vertices. The extremities of its diagonals which does not pass through this vertex are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 37. | If , where , then has at least | | | | | | | |
|  | a) | Four real roots | | | b) | Two real roots | | |
|  | c) | Four imaginary roots | | | d) | None of these | | |
| 38. | If is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 39. | If , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 40. | Let be three collinear points which are such that and the points are represented in the Argand plane by the complex numbers 0, and respectively, Then, | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 41. | If , then the locus of is | | | | | | | |
|  | a) | A circle | | | b) | A straight line | | |
|  | c) | A pair of straight lines | | | d) | None of these | | |
| 42. | If and where , then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 43. | If for complex numbers and then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 0 |
| 44. | If are real and distinct, then is always | | | | | | | |
|  | a) | Non-negative | b) | Non-positive | c) | Zero | d) | None of these |
| 45. | The locus of the centre of the circle which touches the circles and externally ( and are complex numbers) will be | | | | | | | |
|  | a) | An ellipse | b) | A hyperbola | c) | A circle | d) | None of these |
| 46. | The modulus and amplitude of are respectively | | | | | | | |
|  | a) | 256 and | b) | 256 and | c) | 2 and | d) | 256 and |
| 47. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 48. | If is an imaginary cube root of unity and , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 49. | The square roots of are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 50. | A real value of will satisfy the equation , if | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 51. | If is a cube root of unity and are respectively | | | | | | | |
|  | a) | 0, 1 | b) | 1, 1 | c) | 1, 0 | d) |  |
| 52. | If the equation is satisfied values of , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 53. | If the sum of the roots of the equation is then the product of the roots is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | 3 |
| 54. | The roots of the equation are given by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 55. | If and then the roots of the equation are | | | | | | | |
|  | a) | Real and unequal | | | | | | | |
|  | b) | Real and equal | | | | | | | |
|  | c) | Imaginary | | | | | | | |
|  | d) | None of these | | | | | | | |
| 56. | If are the roots of the equation then the values of and are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 57. | If then the equation has | | | | | | | |
|  | a) | Both roots in | | | | | | | |
|  | b) | Both roots in | | | | | | | |
|  | c) | Roots in and other in | | | | | | | |
|  | d) | Both roots in | | | | | | | |
| 58. | The value of is | | | | | | | |
|  | a) | 1 | b) | 0 | c) | -1 | d) | None of these |
| 59. | The value of the expression  is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 60. | One of the square root of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 61. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 62. | If then and are respectively | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 63. | The number of real solutions of the equation is | | | | | | | |
|  | a) | 2 | b) | 4 | c) | 6 | d) | None of these |
| 64. | Number of roots of the equation is | | | | | | | |
|  | a) | One | b) | Two | c) | Infinite | d) | None of these |
| 65. | The smallest positive integer for which is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 66. | If is purely imaginary number , then is equal to | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 67. | If one vertex of a square whose diagonals intersect at the origin is then the two adjacent vertices are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 68. | If the sum of the roots of the equation is equal to the sum of the squares of their reciprocals of their reciprocals, then | | | | | | | |
|  | a) | are in A.P. | | | | | | | |
|  | b) | are in G.P. | | | | | | | |
|  | c) | are in G.P. | | | | | | | |
|  | d) | are in G.P. | | | | | | | |
| 69. | In the argand plane, if and represent respectively the origin and the complex numbers and respectively, then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 70. | If then is equal to | | | | | | | |
|  | a) | 0 | b) | 2 | c) |  | d) | None of these |
| 71. | Let be the roots of the equation and be the roots of the equation . Then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 72. | If is an imaginary cube root of unity, then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 73. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 74. | will be purely imaginary, if is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 75. | If for all then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 76. | Let be two complex numbers such that and both are real, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 77. | If then locus of is | | | | | | | |
|  | a) | A circle | b) | A parabola | c) | A straight line | d) | None of these |
| 78. | Let be a complex number and be a real parameter such that , then | | | | | | | |
|  | a) | Locus of is a pair of straight lines | | | b) | Locus of is a circle | | |
|  | c) |  | | | d) |  | | |
| 79. | The points in the complex plane are the vertices of a parallelogram taken in order, iff | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 80. | If a real valued function of a real variable is such that , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 81. | If , then the roots of the equation are | | | | | | | |
|  | a) | Equal | b) | Imaginary | c) | Real | d) | None of these |
| 82. | For how many values of is a perfect square? | | | | | | | |
|  | a) | 2 | b) | 0 | c) | 1 | d) | 3 |
| 83. | The number of solutions of is | | | | | | | |
|  | a) | 2 | b) | 3 | c) | 1 | d) | None of these |
| 84. | The number of real roots of the equation is | | | | | | | |
|  | a) | 4 | b) | 3 | c) | 2 | d) | 1 |
| 85. | If the difference between the roots of and is same and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 86. | The equation has | | | | | | | |
|  | a) | At least one real solutions | | | b) | Exactly three real solutions | | |
|  | c) | Exactly one irrational solution | | | d) | Complex roots | | |
| 87. | If be three complex numbers such that , then the maximum value of is | | | | | | | |
|  | a) | 7 | b) | 10 | c) | 12 | d) | 14 |
| 88. | If and , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 89. | If are numbers such that then the largest and smallest numbers are | | | | | | | |
|  | a) | and respectively | b) | and respectively | c) | and respectively | d) | and respectively |
| 90. | The number of integral solutions of is | | | | | | | |
|  | a) | 4 | b) | 5 | c) | 3 | d) | None of these |
| 91. | Let be the roots of the equation be the roots of . If are in GP, then integral values of are respectively | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 92. | If the complex numbers satisfying , then triangle is | | | | | | | |
|  | a) | An equilateral triangle | | | b) | A right angled triangle | | |
|  | c) | A acute angled triangle | | | d) | An obtuse angled isosceles triangle | | |
| 93. | If is a complex cube root of unity, then  is equal to | | | | | | | |
|  | a) | 72 | b) | 192 | c) | 200 | d) | 248 |
| 94. | The locus of satisying the inequality where , is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 95. | If the roots of are in A.P., then their common difference is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 96. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 97. | The value of sum equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 0 |
| 98. | If and are imaginary cube roots of unity, then is equal to | | | | | | | |
|  | a) | 3 | b) | 0 | c) | 1 | d) | 2 |
| 99. | If are all positive and in H.P., then the roots of are | | | | | | | |
|  | a) | Real | b) | Imaginary | c) | Rational | d) | Equal |
| 100. | For all complex numbers satisfying and , the minimum value of is | | | | | | | |
|  | a) | 4 | b) | 3 | c) | 1 | d) | 2 |
| 101. | If be the roots of the equation , then | | | | | | | |
|  | a) | and | | | b) | and | | |
|  | c) | and | | | d) | and | | |
| 102. | The number of real roots of the equation is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | None of these |
| 103. | If is a complex number such that is purely imaginary, then | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 5 |
| 104. | If and are any three complex numbers, then the fourth vertex of the parallelogram whose three vertices are and taken in order is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 105. | If is a complex number such that Re , then | | | | | | | |
|  | a) | Re | b) | Im | c) | Re | d) | Re |
| 106. | is equal to | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) |  |
| 107. | Let be a complex number such that and be vertices of a polygon such that . Then the vertices of the polygon lie within a circle is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 108. | If are the roots of the equation , then is | | | | | | | |
|  | a) | 7/3 | b) | 3/7 | c) | 4/7 | d) | 7/4 |
| 109. | If , then the quadratic equation having and as its roots, is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 110. | If are the roots of the equation , then the equation whose roots are and is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 111. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 112. | If one root of the quadratic equation is equal to th power of the other root, then the value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 113. | The modulus of the complex number such that and is equal to | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 9 | d) | 3 |
| 114. | The product of cube roots of -1 is equal to | | | | | | | |
|  | a) | -1 | b) | 0 | c) | -2 | d) | 4 |
| 115. | If the roots of are in arithmetic progression, then the roots of the equation are | | | | | | | |
|  | a) | 3, 4, 5 | b) | 4, 7, 10 | c) | -2, 1, 4 | d) | 1, 4, 7 |
| 116. | The number of values of a for which is an identity in is | | | | | | | |
|  | a) | 0 | b) | 2 | c) | 1 | d) | 3 |
| 117. | If are vertices of an equilateral triangle inscribed in the circle and if then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 118. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 119. | The number of real solutions of the equation is | | | | | | | |
|  | a) | None | b) | One | c) | Two | d) | More than two |
| 120. | The quadratic equation whose roots are three times the roots of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 121. | The values of satisfying are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 122. | If , then is equal to | | | | | | | |
|  | a) | 7 | b) | 4 | c) | 2 | d) | 1 |
| 123. | If… then the value of … is | | | | | | | |
|  | a) | Equal to one | b) | Greater than one | c) | Zero | d) | Less than one |
| 124. | If and are roots of the equation with then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 125. | The amplitude of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 126. | The value of sum , where , equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 0 |
| 127. | If and , then equals | | | | | | | |
|  | a) | 9 | b) | 81 | c) | 1 | d) | 27 |
| 128. | Is is the set of all real such that then is equal to | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 129. | The value of for which the difference between the roots of the equation is 2 are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 130. | If and have a common root, then is equal to | | | | | | | |
|  | a) | 10 | b) | 20 | c) | 30 | d) | 40 |
| 131. | If and represent the vertices of an equilateral triangle, then | | | | | | | |
|  | a) | and | | | | | | | |
|  | b) | and | | | | | | | |
|  | c) | and | | | | | | | |
|  | d) | and | | | | | | | |
| 132. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 133. | If the roots of the equation and roots of the equation then the roots of the equation are | | | | | | | |
|  | a) | Both negative | | | b) | Both positive | | |
|  | c) | Both real | | | d) | One negative and one positive | | |
| 134. | If are the sides of the triangle such that and has real roots, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 135. | The centre of a regular polygon of sides is located at the point and one of its vertex is known. If be the vertex adjacent to then is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 136. | Let . Then, the value of at is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 137. | Let If the origin and the non-real roots of form the three vertices of an equilateral triangle in the argand plane, then | | | | | | | |
|  | a) | 1 | b) | 2 | c) |  | d) | None of these |
| 138. | The region of the Argand diagram defined by is | | | | | | | |
|  | a) | Interior of an ellipse | | | b) | Exterior of a circle | | |
|  | c) | Interior and boundary of an ellipse | | | d) | None of the above | | |
| 139. | The radius of the circle is given by | | | | | | | |
|  | a) |  | b) |  | c) | 5 | d) | 625 |
| 140. | The roots of the cubic equation | | | | | | | |
|  | a) | Represent sides of an equilateral triangle | | | | | | | |
|  | b) | Represent the sides of an isosceles triangle | | | | | | | |
|  | c) | Represent the sides of a triangle whose one side is of length | | | | | | | |
|  | d) | None of these | | | | | | | |
| 141. | If , then modulus of the complex number is equal to | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) | 4 |
| 142. | If centre of a regular hexagon is at origin and one of the vertex on argand diagram is , then its perimeter is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 143. | The value of is | | | | | | | |
|  | a) |  | b) | 0 | c) |  | d) |  |
| 144. | The cubic equation whose roots are thrice to each of the roots of is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 145. | Let . The value of for which roots of this equation are real and distinct, is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 146. | If are the roots of the equation then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 147. | If , then is equal to | | | | | | | |
|  | a) | 0 | b) | 48 | c) | -24 | d) | -48 |
| 148. | The roots of the equation are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 149. | Let be the roots of the equation and let for Then, the value of the determinant  is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 150. | If are roots of unity, then for | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 151. | If are the roots of the equation , then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 152. | If one root of equation is 4 while the equation has equal roots, then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 153. | If , then in terms of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 154. | Number of non-zero integral solutions of the equation is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | Infinite | d) | None of these |
| 155. | The number of non-zero solutions of the equation  is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 156. | If is a positive integer greater than unity and is a complex number satisfying the equation then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 157. | If are the cube roots of unity, then is equal to | | | | | | | |
|  | a) | 1 | b) | 0 | c) |  | d) |  |
| 158. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 159. | If are vertices of an equilateral triangle with its centroid, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 160. | For all , then the interval in which lies, is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 161. | If are the roots of the equation respectively and system of equations has a non-zero solution, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 162. | If are the cube roots of unity, then ... upto factors is | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) |  |
| 163. | If and are different complex numbers with , then is | | | | | | | |
|  | a) | 0 | b) | 3/2 | c) | 1/2 | d) | 1 |
| 164. | In a right-angled triangle, the sides are and , with as hypotenuse, and . Then the value of will be | | | | | | | |
|  | a) | 2 | b) |  | c) |  | d) | 1 |
| 165. | The set of real values of for which is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 166. | If , where and all real numbers, then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 167. | The number of real roots of the equation is | | | | | | | |
|  | a) | 4 | b) | 1 | c) | 0 | d) | 3 |
| 168. | If and are the roots of , then the value of is | | | | | | | |
|  | a) | 32 | b) | 64 | c) | 128 | d) | 256 |
| 169. | If then the greatest and the least value of are | | | | | | | |
|  | a) |  | b) | 6, 0 | c) | 7, 2 | d) |  |
| 170. | If represent the complex number and its additive inverse respectively, then the equation of the circle with as a diameter is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 171. | If is a factor of then the value of is | | | | | | | |
|  | a) |  | b) | 0 | c) | 4 | d) | 2 |
| 172. | If and then will be the set of roots of the equation | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 173. | If and are the roots of the equation and if the sum  exists then it is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 174. | Let be a complex number satisfying | such that amp is minimum. Then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 175. | If and are the roots of and and are the roots of then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 176. | For two complex numbers the relation holds, if | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 177. | If is a complex cube root of unity, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) |  |
| 178. | If the equation has distinct roots between 0 and 1, then the value of is | | | | | | | |
|  | a) | 2 | b) |  | c) | 3 | d) | None of these |
| 179. | If are roots of the equation and then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 180. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 181. | If is a root of the equation then the other roots is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 182. | If the roots of the equation be two consecutive integers, then equals | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | -2 |
| 183. | If are in GP and , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of the above |
| 184. | If the complex numbers form the vertices of equilateral triangle ( are real numbers between 0 and 1), then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 185. | Sum of the series is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 186. | If and are distinct positive real numbers in AP, then the roots of the equation are | | | | | | | |
|  | a) | Imaginary | b) | Rational and equal | c) | Rational and distinct | d) | Irrational |
| 187. | Let be a complex number such that then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 188. | The equation is satisfied by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of the above |
| 189. | The equation has | | | | | | | |
|  | a) | No real root | b) | One real root | c) | Two real roots | d) | Four real roots |
| 190. | If one root of the equation is 4, while the equation has equal roots, then the value of is | | | | | | | |
|  | a) | 4 | b) | 12 | c) | 3 | d) |  |
| 191. | If the greatest integer less than or equal to must be such that | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 192. | If are the roots of the equation whose roots are is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 193. | If and are angles such that and and , then is equal to | | | | | | | |
|  | a) | 1, but not -1 | b) | -1, but not 1 | c) | +1 or -1 | d) | 0 |
| 194. | If and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 195. | If the equation and have a common root, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 196. | The polynomial is exactly divisible by if | | | | | | | |
|  | a) | are rational | | | | | | | |
|  | b) | are integers | | | | | | | |
|  | c) | are positive integers | | | | | | | |
|  | d) | None of these | | | | | | | |
| 197. | If and belongs to the set ,  Then is equal to | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 198. | If the roots of the equation are and respectively, then the value of is | | | | | | | |
|  | a) | 3 | b) | 0 | c) | 1 | d) | 2 |
| 199. | If and , then is equal to | | | | | | | |
|  | a) | 1 | b) | -1 | c) | 2 | d) | -2 |
| 200. | If and are the roots of the equation , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 201. | The number of real roots of the equation is | | | | | | | |
|  | a) | 0 | b) | 2 | c) | 4 | d) | 6 |
| 202. | If and then the quadratic equation has | | | | | | | |
|  | a) | One positive and one negative root | | | | | | | |
|  | b) | Imaginary roots | | | | | | | |
|  | c) | Real roots | | | | | | | |
|  | d) | None of these | | | | | | | |
| 203. | If and are the roots of the equation then the value of  is | | | | | | | |
|  | a) |  | b) | 0 | c) |  | d) | None of these |
| 204. | If then the value of is | | | | | | | |
|  | a) | 32 | b) | 125 | c) | 625 | d) | 25 |
| 205. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 206. | If are the roots of the equation and are the roots of then the equation has always ( are real numbers) | | | | | | | |
|  | a) | Two real roots | | | | | | | |
|  | b) | Two negative roots | | | | | | | |
|  | c) | Two positive roots | | | | | | | |
|  | d) | One positive and one negative roots | | | | | | | |
| 207. | If is real, then the minimum value of , is | | | | | | | |
|  | a) |  | b) | 3 | c) |  | d) | 1 |
| 208. | In the equation roots of the equation are Now, is replaced by , now roots of new equation are | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 209. | The closest distance of the origin from a curve given as is | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) |  |
| 210. | Let and be such that  then is equal to | | | | | | | |
|  | a) | 1/15 | b) | 1/6 | c) | 1/5 | d) | 1/3 |
| 211. | The root of the equation where which has greater modulus, is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 212. | For any complex number the minimum value of is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | 4 |
| 213. | The value of expression where is an imaginary cube root of unity is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 214. | For the equation which one of the following is not true? | | | | | | | |
|  | a) | Has at least one real solution | | | | | | | |
|  | b) | Has exactly three real solutions | | | | | | | |
|  | c) | Has exactly one irrational solution | | | | | | | |
|  | d) | All of these | | | | | | | |
| 215. | If is a factor of , then the values of and are | | | | | | | |
|  | a) | -5, 4 | b) | 5, 4 | c) | 5, -4 | d) | -5, -4 |
| 216. | If the ratio of the equation be equal to the ratio of the roots of then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 217. | If are roots of the equation , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 218. | If the roots of the equation are equal, then are in | | | | | | | |
|  | a) | H.P. | b) | G.P. | c) | A.P. | d) | None of these |
| 219. | If the sum of the squares of the roots of the equation is least, then the value of is | | | | | | | |
|  | a) | 0 | b) | 2 | c) |  | d) | 1 |
| 220. | If then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 221. | The roots of the equation are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 222. | If is a root of Then, the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 223. | If are the roots of the equation , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 4 |
| 224. | If then are represented by | | | | | | | |
|  | a) | Three vertices of a triangle | | | | | | | |
|  | b) | Three collinear points | | | | | | | |
|  | c) | Three vertices of a rhombus | | | | | | | |
|  | d) | None of these | | | | | | | |
| 225. | The condition that one root of the equation may be double of the other, is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 226. | The locus of , where is parameter, is | | | | | | | |
|  | a) | A circle | b) | An ellipse | c) | A parabola | d) | Hyperbola |
| 227. | If and , then the equation having and as its roots is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 228. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 229. | If where then has | | | | | | | |
|  | a) | At least three real roots | | | | | | | |
|  | b) | No real roots | | | | | | | |
|  | c) | At least two real roots | | | | | | | |
|  | d) | Two real roots and two imaginary roots | | | | | | | |
| 230. | If , then the maximum value of is | | | | | | | |
|  | a) | 4 | b) | 10 | c) | 6 | d) | 0 |
| 231. | If and , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 232. | If are the roots of the equation then the quadratic equation whose roots are is given by | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 233. | If magnitude of a complex number is tripled and is rotated anti-clockwise by an angle , then resulting complex number world be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 234. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 235. | The roots of the equation are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 236. | If then belongs to the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 237. | The set and is | | | | | | | |
|  | a) | A finite set | b) | An infinite set | c) | An empty set | d) | None of these |
| 238. | The equation represents | | | | | | | |
|  | a) | An ellipse | | | b) | A parabola | | |
|  | c) | A circle | | | d) | A straight line through point | | |
| 239. | If is a complex cube root of unity, then is equal to | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) | 0 |
| 240. | If the roots of the equation are and , then the equation whose roots are and will be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 241. | The roots of and are simultaneously real, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 242. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 243. | The number of real solutions of the equation are | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 244. | The region of the complex plane for which , is | | | | | | | |
|  | a) | -axis | | | b) | -axis | | |
|  | c) | The straight line | | | d) | None of these | | |
| 245. | The locus of point satisfying is | | | | | | | |
|  | a) | A pair of straight lines | | | | | | | |
|  | b) | A circle | | | | | | | |
|  | c) | A rectangular hyperbola | | | | | | | |
|  | d) | None of these | | | | | | | |
| 246. | The co0mplex number which satisfy the equation lies on | | | | | | | |
|  | a) | The axis of | | | b) | The straight line | | |
|  | c) | The circle passing through the origin | | | d) | None of the above | | |
| 247. | If is a root of where then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 248. | If , then is equal to | | | | | | | |
|  | a) | 2 | b) | 3 | c) | 6 | d) | 5 |
| 249. | if , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 250. | If roots of are prime numbers, then | | | | | | | |
|  | a) | ’ is a prime number | | | b) | is a composite number | | |
|  | c) | is a prime number | | | d) | None of the above | | |
| 251. | Let and be complex numbers, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 252. | If then the relation between is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 253. | The number of complex numbers such that equals | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) |  |
| 254. | If and have a common root where (set of natural numbers), the least value of is | | | | | | | |
|  | a) | 13 | b) | 11 | c) | 7 | d) | 9 |
| 255. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 256. | Let , where . If has all its roots imaginary, then the roots of are | | | | | | | |
|  | a) | Real and distinct | b) | Imaginary | c) | Equal | d) | Rational and equal |
| 257. | If , then the position of the first significant figure of is | | | | | | | |
|  | a) | 16 | b) | 17 | c) | 20 | d) | 15 |
| 258. | If and are two non-zero complex numbers such that and , then is equal to | | | | | | | |
|  | a) | 1 | b) | -1 | c) |  | d) |  |
| 259. | If the sum of the roots of the equation is equal to their products, then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 260. | If are the roots of , then is equal to | | | | | | | |
|  | a) | 12 | b) | 13 | c) | 14 | d) | 15 |
| 261. | If has two rational factors, then the values of will be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 6, 2 |
| 262. | If and are the roots of the equation , and are in AP, then is equal to | | | | | | | |
|  | a) | -4 | b) | 1 | c) | 4 | d) | -2 |
| 263. | If the difference between the roots of is equal to the difference between the roots of , then in terms of and is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 264. | The value of will be | | | | | | | |
|  | a) | 1 | b) | -1 | c) | 2 | d) | -2 |
| 265. | The imaginary part of zero, if | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 266. | If and , the locus of is | | | | | | | |
|  | a) | -axis | | | b) | -axis | | |
|  | c) | Circle with unity radius | | | d) | None of the above | | |
| 267. | If and are roots of the quadratic equation  then the value of is | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 268. | For the equation | | | | | | | |
|  | a) | There is only one root | | | | | | | |
|  | b) | There are only two distinct roots | | | | | | | |
|  | c) | There are only three distinct roots | | | | | | | |
|  | d) | There are four distinct roots | | | | | | | |
| 269. | Let and be two complex numbers such that Then, | | | | | | | |
|  | a) | are collinear | | | | | | | |
|  | b) | and the origin from a right angled triangle | | | | | | | |
|  | c) | and the origin from an equilateral triangle | | | | | | | |
|  | d) | None of these | | | | | | | |
| 270. | If are real and then are in | | | | | | | |
|  | a) | H.P. | b) | G.P. | c) | A.P. | d) | None of these |
| 271. | If | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 2 |
| 272. | If , then is equal to | | | | | | | |
|  | a) | 45 | b) | -15 | c) | 10 | d) | 6 |
| 273. | If are any two complex numbers, then | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 274. | The value of for which the equation has equal root, is | | | | | | | |
|  | a) | 3 | b) | 4 | c) | 2 | d) |  |
| 275. | If then the quadratic equation whose roots are is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 276. | If and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 277. | For any complex number the minimum value of is | | | | | | | |
|  | a) |  | b) | 0 | c) |  | d) |  |
| 278. | The equation represents a circle, if | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 279. | If are the affixes of four points in the argand plane and is the affix of a point such that are | | | | | | | |
|  | a) | Concyclic | | | b) | Vertices of a parallelogram | | |
|  | c) | Vertices of a rhombus | | | d) | In a straight line | | |
| 280. | Let be the roots of the equation and be the roots of the equation . If are in GP, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 281. | If are such that then is equal to | | | | | | | |
|  | a) | 7 | b) | 12 | c) | 18 | d) | 36 |
| 282. | If the roots of the equation are real and less than 3, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 283. | For any two complex numbers and and any real numbers and , is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of the above | | |
| 284. | If is the complex cube root of unity, then the value of | | | | | | | |
|  | a) |  | b) | 1 | c) |  | d) |  |
| 285. | If and are the roots of the equation and, if 0has roots and , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 286. | If then is equal to | | | | | | | |
|  | a) | 48 | b) |  | c) |  | d) | None of these |
| 287. | If are the roots of then the equation whose roots are and is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 288. | Let be the roots of the equation and . Then, is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) |  |
| 289. | The quadratic equations and have | | | | | | | |
|  | a) | No common root for all | | | | | | | |
|  | b) | Exactly one common root for all | | | | | | | |
|  | c) | Two common roots for some | | | | | | | |
|  | d) | None of these | | | | | | | |
| 290. | If are distinct positive numbers each being different from 1 such that  , then is | | | | | | | |
|  | a) | 0 | b) |  | c) | 1 | d) | 2 |
| 291. | Suppose that two persons and solve the equation . While solving commits a mistake in the coefficient of was taken as 15 in place of and finds the roots as and . Then the equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 292. | The values of for which the roots of the equation are real and exceed ‘a’ are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 293. | If are positive real numbers, then the number of real roots of the equation is | | | | | | | |
|  | a) | 2 | b) | 4 | c) | 0 | d) | None of these |
| 294. | If and are two distinct real roots of the polynomial such that then there exists a real number lying between and such that | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 295. | If the cube root of unity are , then the roots of the equation , are | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 296. | A value of for which the quadratic equation has equal roots, is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 297. | is equal to | | | | | | | |
|  | a) |  | b) | 5 | c) | 25 | d) |  |
| 298. | The expression reduces to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 299. | The common roots of the equations and are (where is a complex cube root of unity) | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 300. | If are the cube roots of a negative number , then for any three real numbers the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 301. | has no value of for any , if belongs to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 302. | The value of is equal to | | | | | | | |
|  | a) | 7 | b) |  | c) | 5 | d) | 4 |
| 303. | The quadratic equation in such that the arithmetic mean of its roots is 5 and geometric mean of the roots is 4, is given by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 304. | The shaded region, where    is represented by | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 305. | If and are the two imaginary cube roots of unity, then the equation whose roots are and , is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 306. | If is real, then expression takes all values in the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 307. | If where is a complex constant, then is represented by a point on | | | | | | | |
|  | a) | A circle | b) | A straight line | c) | A parabola | d) | None of these |
| 308. | The value of for which the equations have a common root, is | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) | 2 |
| 309. | If , then the value of is equal to | | | | | | | |
|  | a) | 32 | b) | -64 | c) | 64 | d) | 0 |
| 310. | If are roots of and are root of then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 311. | The roots and of an equation  are in H.P. Then, | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 312. | The value of is | | | | | | | |
|  | a) | Positive | | | b) | Negative | | |
|  | c) | Zero | | | d) | Cannot be determined | | |
| 313. | If are the cube roots of unity, then | | | | | | | |
|  | a) |  | b) | 0 | c) | 1 | d) |  |
| 314. | The value of is | | | | | | | |
|  | a) | 0 | b) | -1 | c) | 1 | d) |  |
| 315. | If for complex numbers and real numbers then lie on a | | | | | | | |
|  | a) | Straight line | | | | | | | |
|  | b) | Circle | | | | | | | |
|  | c) | Depends on the choice of | | | | | | | |
|  | d) | None of these | | | | | | | |
| 316. | If be a cube root of unity and then and are respectively the numbers: | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 317. | If then the expression assumes | | | | | | | |
|  | a) | All real values | | | | | | | |
|  | b) | All real values greater than 0 | | | | | | | |
|  | c) | All real values greater than | | | | | | | |
|  | d) | All real values greater than | | | | | | | |
| 318. | The locus represented by the equation is | | | | | | | |
|  | a) | A circle of radius 1 | | | b) | An ellipse with foci at 1 and | | |
|  | c) | A line through the origin | | | d) | A circle on the line joining 1 and as diameter | | |
| 319. | The number of real roots of the equation is | | | | | | | |
|  | a) | 4 | b) | 2 | c) | 0 | d) | 1 |
| 320. | If the roots of the quadratic equation are real, then the least value of is | | | | | | | |
|  | a) | 81 | b) | 1/81 | c) | 1/64 | d) | None of these |
| 321. | For the equation , if the product of the roots is zero, then the sum of the roots is | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 322. | If , then is equal to | | | | | | | |
|  | a) | 0 | b) | 2 | c) | 3 | d) | 5 |
| 323. | If where, are non-zero has real roots, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 324. | The values of for which the difference between the roots of the equation is are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 325. | If and then | | | | | | | |
|  | a) | 0 | b) | 3 | c) | 8 | d) |  |
| 326. | If is a solution of the equation , where and are real numbers, then the value of is equal to | | | | | | | |
|  | a) | 10 | b) | 22 | c) | 30 | d) | 31 |
| 327. | Re is represented by | | | | | | | |
|  | a) | The circle | | | b) | The hyperbola | | |
|  | c) | Parabola or a circle | | | d) | All of the above | | |
| 328. | If are the roots of the equation , then the value of is | | | | | | | |
|  | a) | 1 | b) | 4 | c) |  | d) | 5 |
| 329. | If and , then the value of is | | | | | | | |
|  | a) | 254 | b) | 192 | c) | 292 | d) | 66 |
| 330. | The complex numbers having positive argument and satisfying , is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 331. | Let denote the set of all values of for which the equation has one root less than and other root greater than then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 332. | If , then one of the roots of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 333. | If and be the vertices of a triangle in which and , then the value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 334. | When is purely imaginary, the locus described by the point in the argand diagram is a | | | | | | | |
|  | a) | Circle of radius | b) | Circle of radius | c) | Straight line | d) | Parabola |
| 335. | Area of the triangle formed by 3 complex numbers in the Argand plane is | | | | | | | |
|  | a) |  | b) | 1 | c) |  | d) |  |
| 336. | The value of for is | | | | | | | |
|  | a) | 0 | b) |  | c) | 160 | d) |  |
| 337. | The locus of the point satisfying arg where is non-zero real, is | | | | | | | |
|  | a) | A circle with centre on -axis | | | | | | | |
|  | b) | A circle with centre on -axis | | | | | | | |
|  | c) | A straight line parallel to -axis | | | | | | | |
|  | d) | A straight line making an angle of with the -axis | | | | | | | |
| 338. | The product of the real roots of the equation  is | | | | | | | |
|  | a) |  | b) |  | c) | 5 | d) | 2 |
| 339. | If be the roots of the quadratic equation , then the equation whose roots are is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 340. | In the argand plane, the complex number is turned in the clockwise sense through and stretched three times. The complex number represented by the new number is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 341. | If is the A.M. of the roots of the equation and is the G.M. of the roots of the equation then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 342. | The maximum value of satisfies the condition , is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 343. | Let are the roots of equation . If , then what is the value of ? | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | -2 |
| 344. | Let . Then, the equation whose roots are and is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 345. | The coefficients of in the quadratic equation was taken as 17 in place of 13, its roots were found to be -2 and -15. The correct root of the original equation are | | | | | | | |
|  | a) | -10, -3 | b) | -9, -4 | c) | -8, -5 | d) | -7, -6 |
| 346. | If are real and distinct, then is always | | | | | | | |
|  | a) | Non-negative | b) | Non-positive | c) | Zero | d) | None of these |
| 347. | If are the roots of the equation , then the value of is | | | | | | | |
|  | a) | 0 | b) |  | c) | 1 | d) |  |
| 348. | If , then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 349. | The locus of satisfying the inequality is | | | | | | | |
|  | a) | Re | b) | Re | c) | Im | d) | None of these |
| 350. | If are real numbers in G.P. such that and are positive, then the roots of the equation | | | | | | | |
|  | a) | Are real and are in ratio | | | | | | | |
|  | b) | Are real | | | | | | | |
|  | c) | Are imaginary and are in ratio where is a complex cube root of unity | | | | | | | |
|  | d) | Are imaginary and are in ratio | | | | | | | |
| 351. | are the roots of the equation then the value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 352. | If is an imaginary cube root of unity, then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 353. | The equation formed by decreasing each root of by 1 is then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 354. | If where is a complex number, then | | | | | | | |
|  | a) | Re | b) | Re | c) | Re | d) | None of these |
| 355. | If are odd integers, then the roots of the equation are | | | | | | | |
|  | a) | Rational | b) | Irrational | c) | Non-real | d) | None of these |
| 356. | If are the roots of the equation , then the equation whose roots are and , is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 357. | If are the roots of the equation , then is | | | | | | | |
|  | a) | 7/3 | b) | 3/7 | c) | 4/7 | d) | 7/4 |
| 358. | If are three quadratic equations of which each pair has exactly one root common, then the number of solutions of the triplet is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 9 | d) | 27 |
| 359. | Let . If is a real number such that is real, then the value of is | | | | | | | |
|  | a) | 4 | b) | -4 | c) | 7 | d) | -7 |
| 360. | The coefficient of in the equation was taken as 17 in place of 13 its roots were found to be . The roots of the original equation are | | | | | | | |
|  | a) | 3 ,10 | b) |  | c) |  | d) | None of these |
| 361. | If , where is a complex number, then the value of is | | | | | | | |
|  | a) | 6 | b) | 12 | c) | 18 | d) | 24 |
| 362. | The set of possible values of for which  has roots whose sum and product are both less than 1 is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 363. | If is a common factor of the expressions and , then is equal to | | | | | | | |
|  | a) | -2 | b) | -1 | c) | 1 | d) | 2 |
| 364. | The value of is equal to | | | | | | | |
|  | a) | 5 | b) | 6 | c) | 7 | d) | 8 |
| 365. | The greatest number among is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | Cannot be determined | | |
| 366. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 367. | If each pair of the equation has a common root, then product of all common roots is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 368. | The value of is | | | | | | | |
|  | a) | 1 | b) | -1 | c) |  | d) |  |
| 369. | If is a complex number such that and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 370. | If are four complex numbers represented by the vertices of a quadrilateral taken in order such that then the quadrilateral is | | | | | | | |
|  | a) | A square | | | b) | A rectangle | | |
|  | c) | A rhombus | | | d) | A cyclic quadrilateral | | |
| 371. | The real root of the equation is | | | | | | | |
|  | a) | -6 | b) | -9 | c) | 6 | d) | -3 |
| 372. | The value of the expression  1.  Where is an imaginary cube root of unit is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of the above | | |
| 373. | If and then are vertices of | | | | | | | |
|  | a) | A right angled triangle | | | | | | | |
|  | b) | An equilateral triangle | | | | | | | |
|  | c) | Isosceles triangle | | | | | | | |
|  | d) | Scalene triangle | | | | | | | |
| 374. | If is real, then the value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 375. | Which of the following is correct? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 376. | If is an integer which leaves remainder one when divided by three, then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 377. | If then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 378. | The roots of are | | | | | | | |
|  | a) | 4, 2 | b) | 0, 4 | c) | -1, 3 | d) | 5, 1 |
| 379. | The greatest negative integer satisfying and is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 380. | The values of and satisfying the equation are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 381. | If and are roots of the quadratic equation , then the equation whose roots are and is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 382. | In a triangle . If and are the roots of , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 383. | The set of values of for which  has at least one real root is given by | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 384. | If lies on the circle then is | | | | | | | |
|  | a) | Purely real | b) | Purely imaginary | c) | Positive real | d) | None of these |
| 385. | If be the roots of , then the value of is | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) |  |
| 386. | If , then is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 3 | d) | None of the above |
| 387. | If , then the value of is | | | | | | | |
|  | a) | 64 | b) | 4 | c) | 8 | d) | 32 |
| 388. | If the modulus and argument form of is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 389. | Let and be the roots of . Then the equation whose roots are is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 390. | then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 391. | The number of solutions of the system of equations is | | | | | | | |
|  | a) | 4 | b) | 3 | c) | 2 | d) | 1 |
| 392. | If then  |maximum amp minimum amp | = | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 393. | If be the roots of the equation and be the roots of the equation then the equation whose roots are is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 394. | If , then can be take the value | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 395. | If is the point in the Agrand diagram corresponding to the complex number  And if is an isosceles right angled triangle, right angled at then represents the complex number | | | | | | | |
|  | a) | or | b) |  | c) | or | d) |  |
| 396. | The solution of equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 397. | If and , then are the roots of the equation | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 398. | The number of non-zero integer solutions of the equation is | | | | | | | |
|  | a) | Infinite | b) | 1 | c) | 2 | d) | None of these |
| 399. | If and are the roots of the equation , then the value of is | | | | | | | |
|  | a) | 45 | b) | 47 | c) | 49 | d) | 50 |
| 400. | If the equations and have a common root, then it is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 401. | The area of the triangle whose vertices are and where and are complex cube roots of unity, is | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) |  |
| 402. | If is a positive integer greater than unity and is a complex number satisfying the equation then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 403. | The complex numbers taken in that order in the Argand plane represent the vertices of a parallelogram iff | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 404. | If are the roots of the equation , then the equation whose roots are , is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 405. | If then the roots of the equation are | | | | | | | |
|  | a) | Imaginary | | | | | | | |
|  | b) | Real | | | | | | | |
|  | c) | One real and one imaginary | | | | | | | |
|  | d) | Equal and imaginary | | | | | | | |
| 406. | If the equations and have to common roots, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 407. | If roots of the equation are equal, then are in | | | | | | | |
|  | a) | AP | b) | HP | c) | GP | d) | None of these |
| 408. | The smallest positive integer for which is | | | | | | | |
|  | a) | 3 | b) | 2 | c) | 4 | d) | None of these |
| 409. | If is the quadratic equation whose roots are and where are the roots of then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 410. | If and are the roots of then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 411. | The points represents the complex numbers , for which lie on | | | | | | | |
|  | a) | A straight line | b) | A circle | c) | A parabola | d) | A hyperbola |
| 412. | The solution of is | | | | | | | |
|  | a) | 4 | b) | 9 | c) | 44 | d) | 99 |
| 413. | If the roots of the equation are two consecutive integers, then is | | | | | | | |
|  | a) |  | b) | 0 | c) | 1 | d) | 2 |
| 414. | For , if the equation and have a common root, then the value of equals | | | | | | | |
|  | a) | -1 | b) | 0 | c) | 1 | d) | 2 |
| 415. | Let be a quadratic expression which is positive for all real and then for any real | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 416. | If , and , then is equal to | | | | | | | |
|  | a) | 0 | b) | 1 | c) | -1 | d) | None of these |
| 417. | The value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 418. | If are the roots of the equation , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 419. | If the difference of the roots of the equation be 1, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 420. | The graph of the function is strictly above the -axis, then must satisfy the inequality | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 421. | If are the roots of and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 422. | One of the values of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 423. | If the equation has roots and where are non-zero constants. Then, | | | | | | | |
|  | a) | has roots and | | | | | | | |
|  | b) | has roots and | | | | | | | |
|  | c) | has roots and | | | | | | | |
|  | d) | has roots and | | | | | | | |
| 424. | If are in GP, then the equation and have a common root, if are in | | | | | | | |
|  | a) | AP | b) | HP | c) | GP | d) | None of these |
| 425. | If is a complex cube root of unity, then the equation will represent a circle, if | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 426. | The real roots of the equation are | | | | | | | |
|  | a) | 1, 8 | b) | -1, -8 | c) | -1, 8 | d) | 1, -8 |
| 427. | Let be the vertices of an equilateral triangle in the Argand plne, then the number is | | | | | | | |
|  | a) | Purely real | | | | | | | |
|  | b) | Purely imaginary | | | | | | | |
|  | c) | A complex number with non-zero real and imaginary parts | | | | | | | |
|  | d) | None of these | | | | | | | |
| 428. | If be the conjugate of the complex number , then which of the following relations is false? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 429. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 430. | The values of for which is positive for any , are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 431. | The roots of the equation are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 432. | The value of , where is the complex cube root of unity, is | | | | | | | |
|  | a) | 49 | b) | 50 | c) | 48 | d) | 47 |
| 433. | The number of solutions for the equations is | | | | | | | |
|  | a) | One solution | b) | 3 solutions | c) | 2 solutions | d) | No solution |
| 434. | If and are the roots of then the equation whose roots are and is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 435. | The quadratic equation whose roots are and is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 436. | If then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 437. | If one root of the equation is (and are positive integers) and , then is equal to | | | | | | | |
|  | a) | 80 | b) | 85 | c) | 90 | d) | 95 |
| 438. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 439. | If are theroots of , then the equation whose roots are is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 440. | The solution set of the equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 441. | The system of equation and has | | | | | | | |
|  | a) | No solution | b) | One solution | c) | Two solutions | d) | None of these |
| 442. | If are complex cube roots of unity, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 443. | If are the roots of equation then the value of the determinant  is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 444. | The least positive integer for which is real, is | | | | | | | |
|  | a) | 2 | b) | 4 | c) | 8 | d) | None of these |
| 445. | Let denote the greatest integer less than or equal to Then, in the number of solutions of the equation is | | | | | | | |
|  | a) | 6 | b) | 4 | c) | 2 | d) | 0 |
| 446. | If at least one root of is common, then the maximum value of is | | | | | | | |
|  | a) | 10 | b) | 0 | c) | Does not exist | d) | None of these |
| 447. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 448. | If and the equation represents an ellipse, then belongs to the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 449. | If is real, the function will assume all real values, provided | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 450. | The value of the expression  1 .  Where is an imaginary cube root of unity, is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 451. | The points representing cube roots of unity | | | | | | | |
|  | a) | Are collinear | | | | | | | |
|  | b) | Lie on a circle of radius | | | | | | | |
|  | c) | From an equilateral triangle | | | | | | | |
|  | d) | None of these | | | | | | | |
| 452. | If the equations and have a common root, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 453. | Consider the following statements:  1. The equation have common root and second equation has equal roots if .  2. If is a root of the equation , then the other root is .  3. The expression is positive for all real values of .  Which of these is/are correct? | | | | | | | |
|  | a) | Only (3) | b) | Only (2) | c) | All of these | d) | None of these |
| 454. | The equation has | | | | | | | |
|  | a) | No real roots | b) | One real root | c) | Two real roots | d) | Four real roots |
| 455. | The solution set of the inequation is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 456. | The solution set of the equation is | | | | | | | |
|  | a) |  | b) | {4} | c) |  | d) | None of these |
| 457. | If is a factor of , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 458. | If the complex numbers and the origin form an equilateral triangle, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | | |
| 459. | If two equations and have only one common root, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 460. | If are the roots of then | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 461. | are complex numbers) has a real root, then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 462. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 463. | If and are the roots of the equation , then are respectively | | | | | | | |
|  | a) | 0 and -16 | b) | 16 and 18 | c) | -16 and 0 | d) | 16 and 0 |
| 464. | If is real, then takes values in the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 465. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 466. | Let be a complex number with and be any complex number, then is equal to | | | | | | | |
|  | a) | 0 | b) | 1 | c) | -1 | d) | 2 |
| 467. | If are the roots of and also of and if are the roots of then is | | | | | | | |
|  | a) | An odd integer | b) | An even integer | c) | Any integer | d) | None of these |
| 468. | If , then the expression equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 469. | Let be the roots of , then the equation whose roots are , is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 470. | If one root of the equation is the square of the other, then the values of are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 471. | If then is equal to | | | | | | | |
|  | a) | 1 | b) | -1 | c) |  | d) |  |
| 472. | The centre of a regular hexagon is at the point. If one of its vertices is at , then the adjacent vertices of are at the points | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 473. | If the real part of is 4, then the locus of the point representing in the complex plane is | | | | | | | |
|  | a) | a circle | b) | a parabola | c) | a hyperbola | d) | an ellipse |
| 474. | Given that has no real roots and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 475. | If is a root of the equation , where and are rational numbers, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 476. | If is a complex number satisfying the equation , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) |  |
| 477. | If , then upto equals | | | | | | | |
|  | a) | -3 | b) | -2 | c) | 1 | d) | -1 |
| 478. | If respectively denote the moduli of the complex numbers and , then their increasing order is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 479. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 480. | If the equation has roots equal in magnitude but opposite in sign, then the value of is | | | | | | | |
|  | a) |  | b) | 0 | c) | 1 | d) | None of these |
| 481. | The roots of the equation are | | | | | | | |
|  | a) | -1, -1, 2 | b) | -1, 1, -2 | c) | -1, 2, -3 | d) | -1, -1, -2 |
| 482. | If the sum of the squares of the roots of the equation is least, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 483. | is equal to | | | | | | | |
|  | a) | 2 | b) | Zero | c) | -1 | d) | 1 |
| 484. | The set of values of for which the roots of the equation are of opposite signs is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 485. | The roots of are always | | | | | | | |
|  | a) | Equal | b) | Imaginary | c) | Real and distinct | d) | Rational and equal |
| 486. | If is a complex number satisfying then has the value | | | | | | | |
|  | a) | when is a multiple of 3 | | | | | | | |
|  | b) | when is not a multiple of 3 | | | | | | | |
|  | c) | when is a multiple of 3 | | | | | | | |
|  | d) | 0 when is not a multiple of 3 | | | | | | | |
| 487. | If be the roots of then the number of equation(s) whose roots are and is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 6 |
| 488. | If , then the maximum value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 2 | d) |  |
| 489. | If , iff | | | | | | | |
|  | a) | Re ( | b) | Im ( | c) |  | d) | None of these |
| 490. | Let be complex numbers such that and. Then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 491. | If is an imaginary cube root of unity, is a positive integer but not a multiple of 3, then the value of is | | | | | | | |
|  | a) | 3 | b) |  | c) | 0 | d) |  |
| 492. | The quadratic equations  And  Have one root in common. The other roots of the first and second equations are integers in the ratio . Then the common root is | | | | | | | |
|  | a) | 2 | b) | 1 | c) | 4 | d) | 3 |
| 493. | If , then radius of the circle is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 494. | If and are roots of the equation then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 495. | The number of real roots of the equation is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | None of these |
| 496. | If is any th root of unity, then upon terms, is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 497. | will be real, if is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 498. | The number of positive integral roots of is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | l2 | d) | 4 |
| 499. | If the area of triangle on the argand place formed by the complex numbers is 600 sq. unit, then is equal to | | | | | | | |
|  | a) | 10 | b) | 20 | c) | 30 | d) | 40 |
| 500. | is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 501. | If is a factor of order of the polynomial of degree then is a root of the polynomial | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 502. | The polynomial has | | | | | | | |
|  | a) | Four real roots | | | b) | At least two real roots | | |
|  | c) | At most two real roots | | | d) | No real roots | | |
| 503. | The roots of the quadratic equation  are | | | | | | | |
|  | a) | and | | | | | | | |
|  | b) | and | | | | | | | |
|  | c) | and | | | | | | | |
|  | d) | None of these | | | | | | | |
| 504. | The roots of the equation are | | | | | | | |
|  | a) | -2, 1, 4 | b) | 0, 2, 4 | c) | 0, 1, 4 | d) | -2, 2, 4 |
| 505. | If be vertices of an equilateral triangle occurring in the anticlockwise sense, then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 506. | The values of for which the equations and will have a common roots are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 507. | The real part of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 508. | If , then is equal to | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 509. | If the sum of the roots of the equation be equal to the sum of the reciprocal of their squares, then will be in | | | | | | | |
|  | a) | AP | b) | GP | c) | HP | d) | None of these |
| 510. | The equation whose roots are reciprocal of the roots of the equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 511. | If one root of the equation is reciprocal of the one root of the equation then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 512. | If is a non-real root of then is equal to | | | | | | | |
|  | a) | 0 | b) |  | c) | 3 | d) | 1 |
| 513. | If the roots of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 514. | If is a cube root of unity, then | | | | | | | |
|  | a) | 0 | b) | 1 | c) |  | d) |  |
| 515. | If a complex number lies in the interior or on the boundary of a circle or radius 3 and centre at then the greatest and least values of are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 516. | If Im, then locus of is | | | | | | | |
|  | a) | An ellipse | b) | A parabola | c) | A straight line | d) | A circle |
| 517. | If , where and , satisfies the condition that is purely real, then the set of values of is | | | | | | | |
|  | a) |  | b) | and | c) |  | d) | None of these |
| 518. | If is a common factor of the expressions then is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) | 2 |
| 519. | If be the roots of unity, then the value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 520. | and are integers. If the A.M. of the roots of and GM of the roots of are equal, then | | | | | | | |
|  | a) | is an odd integer | b) | is an even integer | c) | is an even integer | d) | is an odd integer |
| 521. | The condition that may have two of its roots equal in magnitude but of opposite sign, is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of the above |
| 522. | If and are the solutions of the quadratic equation such that , then | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 523. | Let be real. If has two real roots and , where and , then is | | | | | | | |
|  | a) | <0 | b) | >0 | c) |  | d) | None of these |
| 524. | If represent the vertices of a rhombus taken in the anticlockwise order, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 525. | If may have values | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 526. | The solution set of the inequation is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 527. | If , then the argument of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 528. | If two equations  and, have a common root, then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 529. | The value of expression where is an imaginary cube root of unity is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 530. | If then is equal to | | | | | | | |
|  | a) | -20 | b) | -60 | c) | -120 | d) | 60 |
| 531. | If the roots of the equation are equal in magnitude but opposite in sign, then the product of the roots will be | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 532. |  | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 533. | If has roots equal in magnitude and opposite in sign then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 534. | Real roots of the equation are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 535. | If be the roots of the equation then | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 536. | Given that the equation , where are real and non-zero roots, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 537. | The values of may have one root less than and other root greater than are given by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 538. | If and then is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) | 1 |
| 539. | If are the roots of the equation , then the roots of the equation are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 540. | If are the roots of , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 541. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 542. | Let The number of equations of the form having real roots, is | | | | | | | |
|  | a) | 15 | b) | 9 | c) | 7 | d) | 8 |
| 543. | The locus of the points representing the complex numbers for which is | | | | | | | |
|  | a) | A circle with centre at the origin | | | | | | | |
|  | b) | A straight line passing through the origin | | | | | | | |
|  | c) | The single point | | | | | | | |
|  | d) | None of these | | | | | | | |
| 544. | If then the real values of satisfying are | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 545. | If the roots of the equation are imaginary and the sum of the roots is equal to their product, then | | | | | | | |
|  | a) |  | b) | 4 | c) | 2 | d) | None of these |
| 546. | If the roots of the equation are in arithmetic progression, then is equal to | | | | | | | |
|  | a) | -3 | b) | 1 | c) | 2 | d) | 3 |
| 547. | If at least one value of the complex number satisfy the condition and the inequality then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 548. | If the roots of change by the same quantity, then the expression in that does not change is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 549. | The solution of set of the equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 550. | If is a complex cube root of unity, then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 551. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 552. | The real part of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 553. | Suppose the quadratic equations and are such that are real and . Then | | | | | | | |
|  | a) | Both the equations always have real roots | | | b) | At least one equation always has real roots | | |
|  | c) | Both the equation always have non-real roots | | | d) | At least one equation always has real and equal roots | | |
| 554. | If , then  is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 555. | The values of are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 556. | Let be three vertices of an equilateral triangle circumscribing the circle If and were in anticlockwise sense, then is | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) |  |
| 557. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 558. | The value of for which the sum of the squares of the roots of the equation assumes the least value, is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | 3 |
| 559. | The amplitude of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 560. | The value of for which both the roots of the equation are less than 2, lies in | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 561. | If is acomplex cube root of unity, then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 562. | The modulus and amplitude of are | | | | | | | |
|  | a) | and | b) | 1 and 0 | c) | 1 and | d) | 1 and |
| 563. | If both the roots of the quadratic equation are less than 5, then lies in the interval | | | | | | | |
|  | a) | [4, 5] | b) |  | c) |  | d) | (5, 6] |
| 564. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 565. | If the roots of the equation from a non-decreasing H.P., then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 566. | Rational roots of the equation are | | | | | | | |
|  | a) | and 2 | b) |  | c) |  | d) |  |
| 567. | The expression has always the same sign as, if | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 568. | Let be real number is a root of is a root of and , then the equation has a root of that always satisfies | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 569. | The smallest positive integer for which is | | | | | | | |
|  | a) | 4 | b) | 8 | c) | 2 | d) | 12 |
| 570. | If and , then is equal to | | | | | | | |
|  | a) | -1 | b) | -2 | c) | 0 | d) | 2 |
| 571. | The solution set of the equation  is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 572. | The maximum distance from the origin of coordinates to the point satisfying the equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 573. | The solution of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 574. | If , then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 575. | If are the roots of the equation , then is equal to | | | | | | | |
|  | a) | 80 | b) | 84 | c) | 90 | d) |  |
| 576. | Let be three complex numbers satisfying Let and for If and are the affixes of points and respectively in the Argand plane, then has its | | | | | | | |
|  | a) | Incentre at the origin | | | | | | | |
|  | b) | Centroid at the origin | | | | | | | |
|  | c) | Circumcentre at the origin | | | | | | | |
|  | d) | Orthocentre at the origin | | | | | | | |
| 577. | If , find the value of | | | | | | | |
|  | a) | 3 | b) | 4 | c) | 5 | d) | 6 |
| 578. | If are the roots of , then the equation has roots | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 579. | The argument of the complex number is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 580. | If are in G.P., then the roots of are always | | | | | | | |
|  | a) | Equal | b) | Real | c) | Imaginary | d) | Greater than 1 |
| 581. | If is a polynomial of degree with rational coefficients and and 5 are three roots of , then the least value of is | | | | | | | |
|  | a) | 5 | b) | 4 | c) | 3 | d) | 6 |
| 582. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 583. | If , then is equal to | | | | | | | |
|  | a) | 5 | b) | 1/5 | c) | 2/5 | d) | 5/2 |
| 584. | The number of real roots of , where lying in the interval (1, 3) is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 585. | If is a complex number, then represents | | | | | | | |
|  | a) | -axis | | | b) | A circle | | |
|  | c) | -axis | | | d) | A line parallel to -axis | | |
| 586. | The triangle with vertices at the points is | | | | | | | |
|  | a) | Right angled but not isosceles | | | | | | | |
|  | b) | Isosceles but not right angled | | | | | | | |
|  | c) | Right angled and isosceles | | | | | | | |
|  | d) | Equilateral | | | | | | | |
| 587. | If , then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 588. | If are the cube roots of then for any and the values of are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 589. | If then the value of can be | | | | | | | |
|  | a) | 1 | b) |  | c) | 0 | d) | None of these |
| 590. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 591. | If , then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 592. | In a give parallelogram, if the points represent two complex numbers represents the number | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 593. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 594. | If is a complex number, then the minimum value of is | | | | | | | |
|  | a) | 1 | b) | 0 | c) |  | d) | None of these |
| 595. | The complex numbers and are conjugate to each other for | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | No value of |
| 596. | If the equations and have a common root, then the numerical value of is | | | | | | | |
|  | a) | 1 | b) | 0 | c) |  | d) | None of these |
| 597. | If , then is | | | | | | | |
|  | a) | An ellipse | b) | A straight line | c) | A circle | d) | A parabola |
| 598. | If for the equation , then all the roots of the equation will be real positive of | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 599. | Let and be two complex numbers with and as their principle arguments such that then principal is given by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 600. | Let be a complex cube root of unity. If the equation represents a circle with points representing and as the end points of a diameter, then | | | | | | | |
|  | a) | 4 | b) | 3 | c) | 2 | d) |  |
| 601. | Let ( is measured in radians). Then lies in the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 602. | One root of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 603. | If one of the root of the equation is 3 and one of the roots of the equation is three times the other root, then the value of is equal to | | | | | | | |
|  | a) | 3 | b) | 4 | c) | 2 | d) | 1 |
| 604. | If and and are the least and greatest value of and is the least value of in the interval then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 605. | The harmonic mean of the roots of the equation is | | | | | | | |
|  | a) | 2 | b) | 4 | c) | 6 | d) | 8 |
| 606. | If and are complex numbers representing the vertices of two triangles such that and where is a complex number, then the two triangles | | | | | | | |
|  | a) | Have the same area | b) | Are similar | c) | Are congurent | d) | None of these |
| 607. | The value of for which the equation  has roots of opposite signs, lies in the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 608. | The locus of point satisfying Re, where is a non-zero real number, is | | | | | | | |
|  | a) | A straight line | b) | A circle | c) | An ellipse | d) | A hyperbola |
| 609. | If be a complex number and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 610. | If are complex numbers such that , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 611. | If is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 612. | If and are the roots of equation , then satisfies the equation | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 613. | If the roots of are plotted in the Argand plane, they are | | | | | | | |
|  | a) | On a parabola | | | | | | | |
|  | b) | Concyclic | | | | | | | |
|  | c) | Collinear | | | | | | | |
|  | d) | The vertices of a triangle | | | | | | | |
| 614. | If is a positive integer, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 615. | The roots of the equation are | | | | | | | |
|  | a) | All real | | | | | | | |
|  | b) | All imaginary | | | | | | | |
|  | c) | Two real and two imaginary | | | | | | | |
|  | d) | None of these | | | | | | | |
| 616. | In which quadrant of the complex plane, the point lies? | | | | | | | |
|  | a) | Fourth | b) | First | c) | Second | d) | Third |
| 617. | If are roots of then the equation has roots | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 618. | If the expression is real then the set of all possible value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 619. | If is an integer satisfying and then the number of positive values of is | | | | | | | |
|  | a) | 3 | b) | 4 | c) | 2 | d) | Infinite |
| 620. | For any two complex numbers and and any real numbers and is equal to | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of the above | | |
| 621. | If are roots of the equation then the value of is | | | | | | | |
|  | a) | 0 | b) |  | c) | 1 | d) |  |
| 622. | If then the value of | is | | | | | | | |
|  | a) | 1 | | | b) | …+ | | |
|  | c) |  | | | d) | None of these | | |
| 623. | The value of is | | | | | | | |
|  | a) |  | b) | 0 | c) |  | d) |  |
| 624. | The solution set of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 625. | Let then is equal to | | | | | | | |
|  | a) | 0 | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 626. | The quadratic equation has | | | | | | | |
|  | a) | Only positive solutions | | | b) | Only negative solutions | | |
|  | c) | No solution | | | d) | Both positive and negative solution | | |
| 627. | If are the roots of the equation then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 628. | The solution of the quadratic equation which belongs to the domain of definition of the function are given by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 629. | If is a cube root of unit and is not real, then has the value | | | | | | | |
|  | a) |  | b) | 0 | c) | 1 | d) | 3 |
| 630. | The number of solutions of the equation is | | | | | | | |
|  | a) | 2 | b) | 4 | c) | 6 | d) | 8 |
| 631. | If < 2, then the locus of is | | | | | | | |
|  | a) | | | b) | | | c) | | | d) | None of these |
| 632. | If and 2, 3 are roots of the equation , then the values of and are | | | | | | | |
|  | a) | -5, -30 | b) | -5, 30 | c) | 5, 30 | d) | None of these |
| 633. | Let and represent the complex numbers respectively on the complex plane. If the circumcenter of the triangle lies at the origin, then the orthocentre is represented by the complex number | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 634. | Let is an imaginary cube root of unity. The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 635. | Let . Then  is equal to | | | | | | | |
|  | a) | 2006 | b) | 2005 | c) |  | d) | 1 |
| 636. | If and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 637. | If is purely imaginary number, then is equal to | | | | | | | |
|  | a) |  | b) | 1 | c) |  | d) |  |
| 638. | are root of equation | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 639. | Let be the roots of the equation and let be the roots of the equation If the numbers (in order) form an increasing G.P., then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 640. | If the equation has real roots such that the product of roots is then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 641. | If the product of the roots of the equation is 2, then the sum of roots is | | | | | | | |
|  | a) | 1 | b) |  | c) | 2 | d) |  |
| 642. | Value of is equal to | | | | | | | |
|  | a) | -1 | b) | 1 | c) | 0 | d) | None of these |
| 643. | If are in GP, then roots of are always | | | | | | | |
|  | a) | Real | b) | Real and negative | c) | Greater than one | d) | Non-real |
| 644. | Let and be the roots of the equation where are real. The points represented by and the origin form an equilateral triangle, if | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 645. | If are the cube roots of unity, then is equal to | | | | | | | |
|  | a) | 64 | b) | 729 | c) | 2 | d) | 0 |
| 646. | If and implies that in the complex plane | | | | | | | |
|  | a) | lies on imaginary axis | | | | | | | |
|  | b) | lies on real axis | | | | | | | |
|  | c) | lies on unit circle | | | | | | | |
|  | d) | None of these | | | | | | | |
| 647. | The number of real roots of the equation is | | | | | | | |
|  | a) | 0 | b) | 2 | c) | 3 | d) | 4 |
| 648. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 649. | If then is represented by a point lying on | | | | | | | |
|  | a) | A circle | b) | An ellipse | c) | A straight line | d) | None of these |
| 650. | are in GP. Roots of are always | | | | | | | |
|  | a) | Real | b) | Imaginary | c) | Greater than 1 | d) | Equal |
| 651. | If are the roots of the equation , then the value of is equal to | | | | | | | |
|  | a) |  | b) | 1 | c) |  | d) |  |
| 652. | And are two points on the Argand plane such that the segment is bisected at the point. If the point , which is in the third quadrant has principle amplitude , then the principle amplitude of the point is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 653. | If is purely imaginary, then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 1 |
| 654. | If has real roots and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 655. | If and respectively denote the moduli of the complex numbers and , then the correct one, among the following is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 656. | If , then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 657. | Let be the affixes of the vertices of a triangle having the circumcentre at the origin. If is the affix of it’s orthocentre, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 658. | If are three points in the Argand plane representing the complex numbers such that where then the distance of from the line is | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) | 0 |
| 659. | If the vertices of a quadrilateral be and , then the quadrilateral is | | | | | | | |
|  | a) | Parallelogram | b) | Rectangle | c) | Square | d) | Rhombus |
| 660. | If the roots of the equation be real and equal, then will be in | | | | | | | |
|  | a) | AP | b) | GP | c) | HP | d) | None of these |
| 661. | The equation of the locus of such that , where is a complex number, is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 662. | If  And , then is | | | | | | | |
|  | a) | 6 | b) |  | c) |  | d) |  |
| 663. | If then the value of cannot exceed | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 664. | Let be the solutions of and be the solutions of . If and are the solutions of , then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 665. | The number of integral solutions of is | | | | | | | |
|  | a) | 3 | b) | 4 | c) | 6 | d) | None of these |
| 666. | All the values of for which both roots of the equation are greater than -2 but less than 4 lie in the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 667. | The roots of the given equation are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 668. | Let be the roots of Then, the equation whose roots are is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 669. | The solution set of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 670. | If , then the value of is | | | | | | | |
|  | a) | 55 | b) | 44 | c) | 63 | d) | 42 |
| 671. | If the roots of the given equation are real, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 672. | Let the two numbers have arithmetic mean 9 and geometric mean 4. Then, these numbers are the roots of the quadratic equation | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 673. | If and are the roots of the equation then is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) | 2 |
| 674. | If has the roots , then the value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 675. | The conjugate of complex number is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 676. | If are real and , then the roots of the equation , are | | | | | | | |
|  | a) | Real and equal | | | b) | Unequal and rational | | |
|  | c) | Unequal and irrational | | | d) | Nothing can be said | | |
| 677. | Let , then all real values of for which takes real values, are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 678. | If , then the value of is | | | | | | | |
|  | a) | {125} | b) | {8} | c) |  | d) | {125, 8} |
| 679. | If one root of the equation has equal roots, then is | | | | | | | |
|  | a) | 8 | b) | 16 | c) | 24 | d) | 32 |
| 680. | The locus of the points which satisfy the condition is | | | | | | | |
|  | a) | A straight line | b) | A circle | c) | A parabola | d) | None of these |
| 681. | The value of is equal to ( is an imaginary cube root of unity) | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 682. | If the absolute value of the difference of the roots of the equation exceeds then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 683. | Consider the following statements:  1. If the quadratic equation is such that , then roots of the equation will be 1, .  2. If is quadratic equation such that then roots of the equation will be, .  Which of the statements given above are correct? | | | | | | | |
|  | a) | Only (1) | b) | Only (2) | c) | Both (1) and (2) | d) | Neither (1) nor (2) |
| 684. | The equation  has all its roots | | | | | | | |
|  | a) | Positive | b) | Real | c) | Imaginary | d) | Negative |
| 685. | Let and be real numbers such that and . If and are non-zero complex numbers satisfying and , then a quadratic equation having and as its roots is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 686. | If be the roots of the equation then the equation whose roots are , is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 687. | The equation where is a non-zero complex constant and is a real number, represents | | | | | | | |
|  | a) | A circle | | | | | | | |
|  | b) | A straight line | | | | | | | |
|  | c) | A pair of straight lines | | | | | | | |
|  | d) | None of these | | | | | | | |
| 688. | The equation represents a circle of radius | | | | | | | |
|  | a) | 2 | b) | 3 | c) | 4 | d) | 6 |
| 689. | The value of | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | 3 |
| 690. | If , then the value of will be | | | | | | | |
|  | a) |  | b) | 1 | c) |  | d) |  |
| 691. | If and are two complex numbers such that then which one of the following is not true? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | All of these |
| 692. | The principle amplitude of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 693. | If satisfies , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 694. | The value of is | | | | | | | |
|  | a) |  | b) | 1 | c) |  | d) |  |
| 695. | The centre and the radius of the circle  are respectively | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 696. | If are roots of the equation then the equation whose roots are and is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 697. | The sum of the real roots of the equation  is | | | | | | | |
|  | a) | 4 | b) | 3 | c) | 2 | d) | 10 |
| 698. | The values of such that satisfy the equation real number ) is | | | | | | | |
|  | a) | 4, 4 | b) | 3, 3 | c) | 2, 2 | d) | None of these |
| 699. | If , then lies in the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 700. | If , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 701. | The approximate value of is | | | | | | | |
|  | a) | 3.0037 | b) | 3.037 | c) | 3.0086 | d) | 3.37 |
| 702. | If , then the locus of is | | | | | | | |
|  | a) | A straight line | b) | A circle | c) | A parabola | d) | An ellipse |
| 703. | If , then area of the triangle whose vertices are points is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 704. | If roots of the equation are rational numbers, then which of the following cannot be true? | | | | | | | |
|  | a) | All are even | | | b) | All are odd | | |
|  | c) | is even while are odd | | | d) | None of the above | | |
| 705. | If for and then the value of is | | | | | | | |
|  | a) | Equal to 1 | b) | Less than 1 | c) | Greater than 1 | d) | None of these |
| 706. | If be the roots of the quadratic equation be a real number, then the condition so that is given by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 707. | If then the value of is | | | | | | | |
|  | a) | 3 | b) | 2 | c) | 1 | d) | None of these |
| 708. | If the complex numbers are in AP, then they lie on | | | | | | | |
|  | a) | A circle | b) | A parabola | c) | A straight line | d) | An ellipse |
| 709. | If be a complex number, then represents a circle, if is equal to | | | | | | | |
|  | a) | 30 | b) | 40 | c) | 55 | d) | 35 |
| 710. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 711. | If the roots of the equation of the form is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 712. | The smallest positive integral value of such that is purely imaginary, is equal to | | | | | | | |
|  | a) | 4 | b) | 3 | c) | 2 | d) | 8 |
| 713. | The locus of the point satisfying is | | | | | | | |
|  | a) | -axis | b) | -axis | c) |  | d) |  |
| 714. | If the roots of the equation are complex, where are real, then the roots of the equation are | | | | | | | |
|  | a) | Real and unequal | b) | Real and equal | c) | Imaginary | d) | None of these |
| 715. | If then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 716. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 717. | The area of the triangle whose vertices are represented by the complex number equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 718. | The general value of which satisfies the equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 719. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 720. | If the centre of a regular hexagon is at the origin and one of its vertices on argand diagram is then its perimeter is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 721. | If and are different complex numbers with is equal to | | | | | | | |
|  | a) | 0 | b) | 1/2 | c) | 1 | d) | 2 |
| 722. | If are the roots of the equation , then is equal to | | | | | | | |
|  | a) | 2 | b) | 3 | c) | -4 | d) | 5 |
| 723. | Which of the following statement is true?  (i) The amplitude of the product of the two complex numbers is equal to product of their amplitudes  (ii) For any polynomial with real coefficients imaginary rosts always occur in conjugate pairs  (iii) Order relation exists in complex numbers whereas it does not exist in real numbers  (iv) The values of used as a cube root of unity and as a fourth root of unity are different | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 724. | The solution of the equation  are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 725. | The value of for which one root of the quadratic equation is twice as large as the other, is | | | | | | | |
|  | a) | 2/3 | b) | -2/3 | c) | 1/3 | d) | -1/3 |
| 726. | Given that and are the roots of , then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 727. | If square root of is , then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 728. | If the points are the vertices of an equilateral triangle in the Argand plane, then which one of the following is not correct? | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 729. | If , then | | | | | | | |
|  | a) | , where is any positive integer | | | b) | , where is any positive integer | | |
|  | c) | , where is any positive integer | | | d) | , where is any positive integer | | |
| 730. | If is a variable complex number such that , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 731. | If are the roots of the equation then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 732. | Argument of the complex number is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 733. | If the equation has no real roots and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 734. | If the roots of the equation are equal in magnitude but opposite in sign, then their product is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 735. | The conjugate of the complex number is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 736. | The complex number , which satisfy the equation lies on | | | | | | | |
|  | a) | Real axis | | | b) | The line | | |
|  | c) | A Circle passing through the origin | | | d) | None of the above | | |
| 737. | The equation has | | | | | | | |
|  | a) | No real solution | | | | | | | |
|  | b) | One real solution | | | | | | | |
|  | c) | More than one real solution | | | | | | | |
|  | d) | None of these | | | | | | | |
| 738. | If for then the valu of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 739. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 740. | arg is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 741. | Consider the following statements :   1. The points having affixes from an equilateral triangle, iff 2. If is a complex number, then is periodic. 3. If |   Which of the statements given above are correct? | | | | | | | |
|  | a) | (1)and (2) | b) | (2)and (3) | c) | (3)and (1) | d) | All (1), (2) and (3) |
| 742. | The joint of and passes through | | | | | | | |
|  | a) | Origin | b) |  | c) |  | d) |  |
| 743. | The equation in variable has real roots. Then, belongs to the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 744. | If the roots of the equation are real, then belongs to the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 745. | If and , then Re is equal to | | | | | | | |
|  | a) | -31/17 | b) | 17/22 | c) | -17/31 | d) | 22/17 |
| 746. | The value of is equal to | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) |  |
| 747. | If the difference between the roots of the equation is less than , then the set of possible values of is | | | | | | | |
|  | a) | (-3, 3) | b) |  | c) |  | d) |  |
| 748. | If and are two complex numbers such that then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 749. | Let and be two fixed non-zero complex numbers and a variable complex number. If the lines and are mutually perpendicular, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 750. | If and are odd integers, then the equation has | | | | | | | |
|  | a) | Two odd roots | | | | | | | |
|  | b) | Two integer roots, one odd and one even | | | | | | | |
|  | c) | No integer roots | | | | | | | |
|  | d) | None of these | | | | | | | |
| 751. | Consider the following statements:  1. If the ratio of roots of the quadratic equation be then  2. If the roots of then the roots of .  3. The roots of the equation are reciprocal to , if .  Which of the statements given above are correct? | | | | | | | |
|  | a) | (1) and (2) | b) | (2) and (3) | c) | (1) and (3) | d) | All (1), (2) and (3) |
| 752. | Locus of , is | | | | | | | |
|  | a) | A circle | b) | A semi circle | c) | A straight line | d) | None of these |
| 753. | If are distinct roots of the equation , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 754. | If is a root of quadratic equation , then its roots are | | | | | | | |
|  | a) | 0, 1 | b) | -1, 1 | c) | 0, -1 | d) | -1, 2 |
| 755. | If is a complex cube root of unity, then the value of is | | | | | | | |
|  | a) | 1 | b) | -1 | c) | 3 | d) | 0 |
| 756. | The value of for which where and are the roots of is | | | | | | | |
|  | a) | 4 | b) | 0 | c) | 6 | d) | 2 |
| 757. | If equals | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 758. | If and are two th roots of unity, then is a multiple of | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 759. | If the roots of are and those of are such that then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 760. | If , then the roots of the equation are | | | | | | | |
|  | a) | Equal | b) | Imaginary | c) | Real | d) | None of these |
| 761. | If is a complex number in the Argand plane such that then the lous of is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 762. | If and are the roots of the equation , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 763. | The equation has | | | | | | | |
|  | a) | At least one real solution | | | b) | Exactly three real solution | | |
|  | c) | Exactly one irrational solution | | | d) | All of the above | | |
| 764. | If then the equation does not represent a circle when | | | | | | | |
|  | a) |  | b) | 1 | c) | 2 | d) | 3 |
| 765. | Let be a complex number where and are integers. Then the area of the rectangle whose vertices are the roots of the equation is | | | | | | | |
|  | a) | 48 | b) | 32 | c) | 40 | d) | 80 |
| 766. | If then is equal to | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) |  |
| 767. | The complex numbers sin are conjugate to each other for | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | No value of |
| 768. | The number which exceeds its positive square roots by 12, is | | | | | | | |
|  | a) | 9 | b) | 16 | c) | 25 | d) | None of these |
| 769. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 770. | The product of all values of is | | | | | | | |
|  | a) | 1 | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 771. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) | 1 |
| 772. | If can be expanded in the ascending powers of , then the coeficient of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 773. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 774. | The points in the set (where denotes the set of all complex numbers) lie on the curve which is a | | | | | | | |
|  | a) | Circle | b) | Pair of lines | c) | Parabola | d) | Hyperbola |
| 775. | The number of solution of is | | | | | | | |
|  | a) | 3 | b) | 1 | c) | 2 | d) | 0 |
| 776. | If then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 777. | If then the product of roots of as is | | | | | | | |
|  | a) |  | b) | 0 | c) | 1 | d) | None of these |
| 778. | If and where , then the equation whose roots are and is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 779. | If and the equations and have two roots in common, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 780. | Which of the following is a fourth root of? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 781. | Number of integer roots of the equation is | | | | | | | |
|  | a) | 0 | b) | 4 | c) | 2 | d) | None of these |
| 782. | If the roots of and the roots of is equal to | | | | | | | |
|  | a) | 0 | b) | 1 | c) |  | d) |  |
| 783. | If is purely imaginary, then the value of is | | | | | | | |
|  | a) | 37/33 | b) | 2 | c) | 1 | d) | 3 |
| 784. | If a root of the equation be reciprocal of a root of the equation , then | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of the above | | |
| 785. | If , where is a complex number, then the point will lie on | | | | | | | |
|  | a) | A circle | b) | An ellipse | c) | A straight line | d) | None of these |
| 786. | If one root of the equation is , then the other root is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 787. | The sum of non-real roots of the equation  is | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) | 6 |
| 788. | If one root of the equation is 4, while the equation has equal roots, then the value of is | | | | | | | |
|  | a) |  | b) |  | c) | 4 | d) | None of these |
| 789. | If then belongs to the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 790. | If is divisible by then is a root of the equation | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 791. | If and are the roots of the equation then | | | | | | | |
|  | a) |  | b) | or 0 | c) |  | d) | or 0 |
| 792. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 793. | The number of real solutions of the equation | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 0 | d) | None of these |
| 794. | For any complex number , the minimum value of is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | -1 |
| 795. | The difference between two roots of the equation is 2. Then the roots of the equation are | | | | | | | |
|  | a) | -3, 7, 9 | b) | -3, -7, -9 | c) | 3, -5, 7 | d) | -3, -7, 9 |
| 796. | If , then the greatest and the least value of are respectively | | | | | | | |
|  | a) | 6, -6 | b) | 6, 0 | c) | 7, 2 | d) | 0, -1 |
| 797. | The number of roots of the equation is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 0 | d) | Infinitely many |
| 798. | The equation represents a circle of radius | | | | | | | |
|  | a) | 5 | b) |  | c) |  | d) | None of these |
| 799. | The number of solutions for the equation is | | | | | | | |
|  | a) | 4 | b) | 3 | c) | 2 | d) | 1 |
| 800. | If one root is square of the root of the equation , then the relation between and is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 801. | If the roots of the equation are in GP, then the roots are | | | | | | | |
|  | a) |  | b) | 2, 4, 8 | c) | 3, 6, 12 | d) | None of these |
| 802. | The values of and such that satisfy the equation real numbers) is | | | | | | | |
|  | a) | 4, 4 | b) | 3, 3 | c) | 2, 2 | d) | None of these |
| 803. | If are the roots of the equation then the equation whose roots are , is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of these | | |
| 804. | The real part of is | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) |  |
| 805. | If are the cube roots of unity, then  is equal to | | | | | | | |
|  | a) | 0 | b) | 1 | c) |  | d) |  |
| 806. | If both the roots of the equation are zero, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 807. | If the roots of the equation differ by unity, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 808. | If and (where ), then is | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 809. | The least positive integer for which where is | | | | | | | |
|  | a) | 2 | b) | 4 | c) | 8 | d) | 12 |
| 810. | If are the roots of the equation , then the value of is | | | | | | | |
|  | a) | 0 | b) | 3 | c) | -3 | d) | -1 |
| 811. | Let be a complex number (not lying on -axis) of maximum modulus such Then, | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 812. | If is a root of order 2 of a polynomial then is also a root of the polynomial | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 813. | If and then | | | | | | | |
|  | a) | 0 | b) | 3 | c) | 18 | d) |  |
| 814. | If is a complex cube root of unity, then the value of is | | | | | | | |
|  | a) | 1 | b) | 0 | c) | 2 | d) |  |
| 815. | Let and . If and are in GP, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 816. | If and is a positive integer, then is equal to | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) | 0 |
| 817. | The additive inverse of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 818. | The equation has the product of roots equal to 31, then for what value of it has real roots? | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 819. | The locus of the point which satisfy the condition arg , is | | | | | | | |
|  | a) | A straight line | b) | A circle | c) | A parabola | d) | None of these |
| 820. | The complex number when represented in the Argand daigram is | | | | | | | |
|  | a) | In the second quadrant | | | b) | In the first quadrant | | |
|  | c) | On the -axis (imaginary axis) | | | d) | On the -axis (real axis) | | |
| 821. | If are in G.P., then the equations and have a common root if are in | | | | | | | |
|  | a) | A.P. | b) | G.P. | c) | H.P. | d) | None of these |
| 822. | The value of is | | | | | | | |
|  | a) | 10 | b) | 6 | c) | 8 | d) | 4 |
| 823. | Let of , then the equation whose roots are is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 824. | is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 825. | The equations and have 2 roots in common. Then, must be equal to | | | | | | | |
|  | a) | 1 | b) |  | c) | 0 | d) | None of these |
| 826. | If the roots of the equation are equal then are in | | | | | | | |
|  | a) | G.P. | b) | A.P. | c) | H.P. | d) | None of these |
| 827. | If at least one root of the equation remains unchanged, when are decreased by one, then which one of the following is always a root of the given equation? | | | | | | | |
|  | a) | 1 | | | b) |  | | |
|  | c) | an imaginary cube root of unity | | | d) |  | | |
| 828. | If Re then lies on the curve | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 829. | If and then the equation having and as its roots is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 830. | If the cube roots of unity are , then the roots of the equation are | | | | | | | |
|  | a) | -1, -1, -1 | b) |  | c) |  | d) |  |
| 831. | If the equation have a common root, then is equal to | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 832. | If is a complex number in the Argand plane, then the equation represents | | | | | | | |
|  | a) | A parabola | b) | An ellipse | c) | A hyperbola | d) | A circle |
| 833. | Let and be the roots of the equation The equation whose roots are is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 834. | If and are the roots of the equation and satisfy the relation , then the value of is | | | | | | | |
|  | a) | -8 | b) | 8 | c) | -16 | d) | 9 |
| 835. | The values of satisfying is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 836. | Let , where and Then the value of is | | | | | | | |
|  | a) | 13 | b) |  | c) |  | d) | 12 |
| 837. | For has the value | | | | | | | |
|  | a) |  | b) | 0 | c) | 1 | d) | 2 |
| 838. | A value of such that is | | | | | | | |
|  | a) | 12 | b) | 3 | c) | 2 | d) | 1 |
| 839. | The number of integral solutions of is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 5 | d) | None of these |
| 840. | If and are the roots of , then the equation whose roots are is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 841. | Real roots of the equation are | | | | | | | |
|  | a) | 1, -1 | b) | 2, 0 | c) | 0, 1 | d) | None of these |
| 842. | If and are the roots of the equation , then is equal to | | | | | | | |
|  | a) | Zero | b) | Positive | c) | Negative | d) | None of these |
| 843. | If and is constant, the locus of is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 844. | Both the roots of the given equation  are always | | | | | | | |
|  | a) | Positive | b) | Negative | c) | Real | d) | Imaginary |
| 845. | The roots of are equal, then the value of is | | | | | | | |
|  | a) | 4/5 | b) | 1/3 | c) |  | d) | 4/3 |
| 846. | The complex number satisfies the condition The maximum distance from the origin of coordinates to the point is | | | | | | | |
|  | a) | 25 | b) | 30 | c) | 32 | d) | None of these |
| 847. | If is a factor of , then the value of is | | | | | | | |
|  | a) | 4 | b) | 2 | c) | 1 | d) | None of these |
| 848. | If are real and is divisible by and then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) | or | | | | | | | |
|  | d) | None of these | | | | | | | |
| 849. | If are in A.P. and if and have a common root then | | | | | | | |
|  | a) | are in A.P. | b) | are in A.P. | c) | are in G.P. | d) | None of these |
| 850. | Let and be two complex numbers such that , and . Then, is equal to | | | | | | | |
|  | a) | 1 or | b) | or | c) | 1or -1 | d) | or |
| 851. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 852. | If is a factor of the expression , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 853. | If are two complex numbers such that then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 854. | The system has | | | | | | | |
|  | a) | No solution | | | | | | | |
|  | b) | One solution | | | | | | | |
|  | c) | Two solution | | | | | | | |
|  | d) | More than 2 solutions | | | | | | | |
| 855. | The set of all real values of for which is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 856. | If be a cube root of unity and , then the least positive value of is | | | | | | | |
|  | a) | 2 | b) | 3 | c) | 5 | d) | 6 |
| 857. | How many roots of the equation have? | | | | | | | |
|  | a) | One | b) | Two | c) | Infinite | d) | None of these |
| 858. | If and are two polynomials such that the polynomial is divisible by then which one of the following is not true? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 859. | The maximum number of real roots of the equation is | | | | | | | |
|  | a) | 2 | b) | 3 | c) |  | d) |  |
| 860. | Given that ‘a’ is a fixed complex number, and is a scalar variable, the point satisfying traces out | | | | | | | |
|  | a) | A straight line through the point | | | | | | | |
|  | b) | A circle with centre at the point | | | | | | | |
|  | c) | A straight line through the point and perpendicular to the join 0 and that point | | | | | | | |
|  | d) | None of these | | | | | | | |
| 861. | The complex numbers are the vertices of a triangle. Then the complex number which makes the triangle into a parallelogram, is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | All of these |
| 862. | If and are the non-zero distinct roots of then the least value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 1 |
| 863. | If are two complex numbers satisfying , then is equal to | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 864. | The value of the determinant , where is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 865. | If and , then lies on | | | | | | | |
|  | a) | A parabola | b) | A straight line | c) | A circle | d) | An ellipse |
| 866. | The value of is | | | | | | | |
|  | a) | 1 | b) | 6 | c) |  | d) | 3 |
| 867. | The value of for which one of the roots of is double of one of the roots of is | | | | | | | |
|  | a) | 1 | b) |  | c) | 2 | d) | None of these |
| 868. | If , then the roots of the equation are | | | | | | | |
|  | a) | Real and distinct | b) | Real and equal | c) | Imaginary | d) | None of these |
| 869. | If then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 870. | If are the roots of , then is equal to | | | | | | | |
|  | a) | 12 | b) | 13 | c) | 14 | d) | 15 |
| 871. | The magnitude and amplitude of are respectively | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 872. | If and the equation has rational roots, then is of the form | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 873. | For three complex numbers which of the following is true? | | | | | | | |
|  | a) | They form a right triangle | | | b) | They are collinear | | |
|  | c) | They form an equilateral triangle | | | d) | They form an isosceles triangle | | |
| 874. | The triangle formed by the points 1, and as vertices in the Argand diagrams is | | | | | | | |
|  | a) | Scalene | b) | Equilateral | c) | Isosceles | d) | Right-angled |
| 875. | The minimum value of , where and are all not equal integers and is a cube root of unity, is | | | | | | | |
|  | a) |  | b) | 1/2 | c) | 1 | d) | 0 |
| 876. | If is a complex cube root of unity, then for positive integral value of , the product of will be | | | | | | | |
|  | a) |  | b) |  | c) | 1 | d) | Both (b) and (c) |
| 877. | If the equations and have both roots common, then the value of is | | | | | | | |
|  | a) | 0 | b) |  | c) | 1 | d) | None of these |
| 878. | If , then is equal to | | | | | | | |
|  | a) | 0 | b) | 1 | c) | -1 | d) | 2 |
| 879. | The centre of a square is at is then the centroid of the triangle is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 880. | If is a complex number, then is equal to | | | | | | | |
|  | a) | 1 | b) |  | c) | 0 | d) | None of these |
| 881. | If , then lies on | | | | | | | |
|  | a) | The real axis | b) | The imaginary axis | c) | A circle | d) | An ellipse |
| 882. | Let denote the set of all real values of for which the roots of the equation lie between 5 and 10, then equals | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 883. | If then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 884. | If is a comple number such that , then | | | | | | | |
|  | a) | is purely real | | | b) | is purely imaginary | | |
|  | c) | is any complex number | | | d) | Real part of is the same as its imaginary part | | |
| 885. | The condition that shall be divisible by is that | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 886. | The value of is | | | | | | | |
|  | a) | 2 | b) |  | c) | 1 | d) | 0 |
| 887. | If and are the roots of then is | | | | | | | |
|  | a) | 3 | b) |  | c) |  | d) |  |
| 888. | Let be the roots of , then the equation whose roots are is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | +1=0 |
| 889. | If then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 890. | If and be the vertices of a triangle in which and , then the value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 891. | The equation has | | | | | | | |
|  | a) | No solution | | | b) | Two solutions | | |
|  | c) | Four solutions | | | d) | An infinite number of solutions | | |
| 892. | The curve represented by where is a non-zero real number, is | | | | | | | |
|  | a) | A pair of straight lines | | | | | | | |
|  | b) | An ellipse | | | | | | | |
|  | c) | A parabola | | | | | | | |
|  | d) | A hyperbola | | | | | | | |
| 893. | If , then is equal to | | | | | | | |
|  | a) | 5 | b) | 8 | c) | 10 | d) | 40 |
| 894. | If and , then the quadratic equation whose roots are and is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 895. | The set of values of satisfying inequations and is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 896. | If are two complex numbers such that and where then the angle between and is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 897. | If roots of are imaginary then | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | Exactly two of and are positive | | | | | | | |
| 898. | If be the roots of , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 899. | If and are two pairs of conjugate complex numbers, then equals | | | | | | | |
|  | a) | 0 | b) |  | c) |  | d) |  |
| 900. | If , then is equal to | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 1/2 |
| 901. | If are represented by the complex numbers respectively, then is a | | | | | | | |
|  | a) | A rectangle | b) | A square | c) | A rhombus | d) | A parallelogram |
| 902. | If the least value of the expression is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 903. | If be a factor of is equal to | | | | | | | |
|  | a) | (3, 4) | b) | (4, 5) | c) | (4, 3) | d) | (5, 4) |
| 904. | The number of solutions of the equation  is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | Infinitely many |
| 905. | The centre of a square is at is then the centroid of the triangle is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 906. | If is real, then the maximum and minimum values of the expression will be | | | | | | | |
|  | a) | 2, 1 | b) |  | c) |  | d) | None of these |
| 907. | For positive integers the value of the expression is a real number if and only if | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 908. | Let and Then, the equation whose roots are is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 909. | If the roots of the given equation are real, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 910. | The set of all integral values of for which is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 911. | If one root of the equation is reciprocal of other, then the value of is | | | | | | | |
|  | a) | 0 | b) | 5 | c) |  | d) | 6 |
| 912. | The equation has rational roots for | | | | | | | |
|  | a) | All rational values of except | | | | | | | |
|  | b) | All real values of except | | | | | | | |
|  | c) | Rational values of | | | | | | | |
|  | d) | None of these | | | | | | | |
| 913. | The value of for which the equation has both roots real, distinct and negative, is | | | | | | | |
|  | a) | 0 | b) | 2 | c) | 3 | d) |  |
| 914. | If are the roots of then the equation in has the roots | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 915. | The number of real roots of is | | | | | | | |
|  | a) | 0 | b) | 2 | c) | 1 | d) | 4 |
| 916. | If one of the roots of the equation is thrice the other, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) |  |
| 917. | is equal to | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 918. | If and then the value of is | | | | | | | |
|  | a) | 3 | b) |  | c) |  | d) | 0 |
| 919. | The vertices and of a parallelogram are and If the diagonals are at right angles and the complex number representing is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 920. | One lies between the roots of the equation if and only if lies in the interval | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 921. | If the sum of the roots of the quadratic equation is equal to the sum of the square of their reciprocals, then and are in | | | | | | | |
|  | a) | Arithmetic progression | | | b) | Geometric progression | | |
|  | c) | Harmonic progression | | | d) | Arithmetico-geometric progression | | |
| 922. | If the roots of are equal, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 923. | If is a cube root of unity, then the value of is | | | | | | | |
|  | a) | 30 | b) | 32 | c) | 2 | d) | None of these |
| 924. | The complex number satisfying and is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 925. | If and are the roots of the equation and then which one of the following is true? | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 926. | If the sum of two of the roots of is zero, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 927. | The roots of the equation are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 928. | If then the value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 929. | for three distinct values of for some is equal to | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | Does not exist |
| 930. | Given that with and that . Then, is equal to | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) |  |
| 931. | If are the four complex numbers represented by the vertices of a quadrilateral taken in order such that and then the quadrilateral is | | | | | | | |
|  | a) | A rhombus | | | | | | | |
|  | b) | A square | | | | | | | |
|  | c) | A rectangle | | | | | | | |
|  | d) | Not a cyclic quadrilateral | | | | | | | |
| 932. | The solution set of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 933. | The number of real solution of the equation is | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | None of these |
| 934. | Solution of the equation is | | | | | | | |
|  | a) | 3 | b) | 2 | c) |  | d) |  |
| 935. | For what value of the sum of the squares of the roots of is minimum? | | | | | | | |
|  | a) |  | b) | 1 | c) |  | d) |  |
| 936. | If is a root of the equation where and are real, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 937. | The value of in the given equation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 938. | If then the set of values of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 939. | If then the value of the product must be | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 940. | If complex numbers and represent the vertices respectively of an isosceles triangle of which is right angle, then correct statement is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 941. | If the equation has roots equal in magnitude but opposite in sign, then the roots of the equation are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 942. | If , then the value of is | | | | | | | |
|  | a) | 3 | b) | 6 | c) | 9 | d) | 27 |
| 943. | The point of intersection of the curves is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | No point |
| 944. | The solution set of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 945. | If and are in geometric progression and the roots of the equation are and and those of are and , then | | | | | | | |
|  | a) |  | | | b) | and | | |
|  | c) |  | | | d) | and | | |
| 946. | Root(s) of the equation belonging to the domain of definition of the function is (are) | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 947. | If are the roots of the equation and if are two values of obtained from , then is equal to | | | | | | | |
|  | a) | 4192 | b) | 4144 | c) | 4096 | d) | 4048 |
| 948. | If the roots of the equation be equal in magnitude but opposite in sign, then is equal to | | | | | | | |
|  | a) | 0 | b) | 1 | c) | 2 | d) | None of these |
| 949. | If then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 950. | The points representing complex number for which lie on the locus given by | | | | | | | |
|  | a) | An ellipse | b) | A circle | c) | A straight line | d) | None of these |
| 951. | The solution set of the inequation is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) | () | | | | | | | |
|  | d) |  | | | | | | | |
| 952. | The number of quadratic equations which are unchanged by squaring their roots is | | | | | | | |
|  | a) | 2 | b) | 4 | c) | 6 | d) | None of these |
| 953. | A point which represents a complex number moves such that , then its locus is | | | | | | | |
|  | a) | A circle with centre | | | b) | A circle with centre | | |
|  | c) | A circle with centre | | | d) | Perpendicular bisector of line joining and | | |
| 954. | The are the roots of the equation , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 955. | If and , then value of equals | | | | | | | |
|  | a) | 2 | b) | 4 | c) | 6 | d) | 1 |
| 956. | Let be the non-real roots of the equation If the origin together with the points represented by form an equilateral triangle, then the value of is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | None of these |
| 957. | If correlation , evaluate | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 4 |
| 958. | If is a factor of the cubic polynomial then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 959. | Find the complex number satisfying the equations | | | | | | | |
|  | a) | 6 | b) |  | c) |  | d) | None of these |
| 960. | The number of real roots of the equation are | | | | | | | |
|  | a) | 1 | b) | 2 | c) | Infinite | d) | None of these |
| 961. | If then which of the following is correct? | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 962. | If is a root of the equation , then the value of is | | | | | | | |
|  | a) | (-7, 4) | b) | (-4, 7) | c) | (4, -7) | d) | (7, -4) |
| 963. | The equation of a circle whose radius and centre are respectively, is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of the above | | |
| 964. | The value of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 965. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 966. | If are the roots of unity and and are any two complex numbers, then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 967. | If are the roots of and are the roots of then the roots of are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 968. | The modulus of is | | | | | | | |
|  | a) | 2 | b) |  | c) | 0 | d) |  |
| 969. | If and are the roots of the equation , then the values of and are respectively | | | | | | | |
|  | a) | 2 and | b) | 2 and | c) | 1 and | d) | 1 and 2 |
| 970. | The trigonometric form of where is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 971. | If one root of the equation is , then the value of the and respectively | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 972. | The value of is | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) |  |
| 973. | The value of which satisfy the equation  is | | | | | | | |
|  | a) | 3 | b) | 2 | c) | 1 | d) | 0 |
| 974. | If the expression is always non-negative, then the minimum value of must be | | | | | | | |
|  | a) |  | b) | 0 | c) |  | d) |  |
| 975. | If , then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 976. | If the equations and have a negative common root, then | | | | | | | |
|  | a) | 0 | b) | 2 | c) | 1 | d) | None of these |
| 977. | If is a complex cube root of unity, then is equal to | | | | | | | |
|  | a) | 0, if is an even integer | | | | | | | |
|  | b) | 0 for all | | | | | | | |
|  | c) | for all | | | | | | | |
|  | d) | None of these | | | | | | | |
| 978. | The value of for which the equation has two roots equal in magnitude but opposite sign, is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 979. | If , then is equal to | | | | | | | |
|  | a) | 4 | b) | 5 | c) | 6 | d) | 8 |
| 980. | If is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 981. | If then the value of is | | | | | | | |
|  | a) |  | b) |  | c) | 0 | d) | None of these |
| 982. | If the equation has a root of order then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 983. | The solution of the equation when two of the roots in the ration , is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 984. | If and be complex numbers such that and .If has positive real part and has negative imaginary part, then may be | | | | | | | |
|  | a) | Purely imaginary | b) | Real and positive | c) | Real and negative | d) | None of these |
| 985. | If then both the roots of the equation | | | | | | | |
|  | a) | Are real and negative | | | b) | Have negative real part | | |
|  | c) | Are rational numbers | | | d) | None of the above | | |
| 986. | If are the roots of the equation denotes the greatest integer function) | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | Does not exist |
| 987. | If , where , then the locus of is a | | | | | | | |
|  | a) | Hyperbola | b) | Parabola | c) | Ellipse | d) | Straight line |
| 988. | Common roots of the equations and are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 989. | The greatest and the least value of if and are respectively | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 990. | If and are the roots of the equation , then the quadratic equation with and as its root is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) |  | | |
| 991. | The value of is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | 5 |
| 992. | If then represents the vertices of a/an | | | | | | | |
|  | a) | Equilateral triangle | b) | Isosceles triangle | c) | Right angled triangle | d) | None of these |
| 993. | The roots of the quadratic equation are | | | | | | | |
|  | a) | Imaginary | | | b) | Real, rational and equal | | |
|  | c) | Real irrational and unequal | | | d) | Real, rational and unequal | | |
| 994. | If are the roots of 0, then the value of is | | | | | | | |
|  | a) | -7 | b) | -5 | c) | -3 | d) | 0 |
| 995. | If and then | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 996. | The conjugate of a complex number is. Then, that complex number is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 997. | If the roots of the equation then the roots of the equation are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 998. | If the points are the vertices of an equilateral triangle in the complex plane, then the value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 999. | If the expressions and have a common root, then the values of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 1000. | If then belongs to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 1001. | Let and be the affixes of the vertices of a triangle having the circumcentre at the origin. If is the affix of its orthocentre, then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 1002. | If the equation has non-real roots and then is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | = 0 |
| 1003. | If are the cube roots of unity, then is equal to | | | | | | | |
|  | a) | 1 | b) | -1 | c) |  | d) | 0 |
| 1004. | If , then the least one of the equation has | | | | | | | |
|  | a) | Real roots | | | b) | Purely imaginary roots | | |
|  | c) | Imaginary roots | | | d) | None of the above | | |
| 1005. | The imaginary part of is | | | | | | | |
|  | a) | 4/5 | b) | 0 | c) | 2/5 | d) | -(4/5) |
| 1006. | The partial fraction of is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of the above | | |
| 1007. | If , then lies on | | | | | | | |
|  | a) | Re | b) | Im | c) | Re | d) | None of the above |
| 1008. | if one of the roots of the equation is then the other root is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 1009. | If the imaginary part of the expression be zero, then the locus of is | | | | | | | |
|  | a) | A straight line parallel to -axis | | | b) | A parabola | | |
|  | c) | A circle of radius 1 and centre (1, 0) | | | d) | None of the above | | |
| 1010. | The locus of the point satisfying the equation is given by | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 1011. | Number of real roots of the equation is | | | | | | | |
|  | a) | 4 | b) | 2 | c) | 0 | d) | None of these |
| 1012. | If then belongs to | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 1013. | is a straight line through the origin and represent the complex numbers and respectively and Then which one of the following is not true? | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 1014. | If are the roots of the equation , then the equation whose roots are and , is | | | | | | | |
|  | a) |  | | | b) |  | | |
|  | c) |  | | | d) | None of the above | | |
| 1015. | The argument of is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 1016. | The number of non-zero integral solutions of the equation is | | | | | | | |
|  | a) | Infinite | b) | 1 | c) | 2 | d) | None of these |
| 1017. | The smallest positive integer for which , is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 1018. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 1019. | The solution set of the inequation is | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) | None of these | | | | | | | |
| 1020. | If is a root of the quadratic equation , then another root is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | All of these |
| 1021. | If is a complex root of the equation is equal to | | | | | | | |
|  | a) |  | b) | 0 | c) | 9 | d) |  |
| 1022. | The solution set of the inequation is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 1023. | If is the root of the equation (where and are real), then the value of is equal to | | | | | | | |
|  | a) | 45 | b) | 15 | c) |  | d) |  |
| 1024. | Let then the roots of the equation | | | | | | | |
|  | a) | Are imaginary | | | b) | Are real and equal | | |
|  | c) | Are from the set | | | d) | Real and distinct | | |
| 1025. | Product of the real roots of the equation | | | | | | | |
|  | a) | Is always positive | b) | Is always negative | c) | Does not exist | d) | None of these |
| 1026. | The centre of a square is at The affix of the vertex is Then, the affix of the centroid of the triangle is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 1027. | The point (4, 1) undergoes the following three transformations successively  (i) Refletion about the line  (ii) Translation through a distance of 2 unit along the positive direction of -axis  (iii) Rotation through an angle of about the origin in the anti-clockwise direction  The final position of the point is | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 1028. | If and are roots of the equation then are roots of the equation | | | | | | | |
|  | a) |  | | | | | | | |
|  | b) |  | | | | | | | |
|  | c) |  | | | | | | | |
|  | d) |  | | | | | | | |
| 1029. | The real roots of are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 1030. | Number of solutions of the equation where is | | | | | | | |
|  | a) | 1 | b) | 2 | c) | 3 | d) | Infinity many |
| 1031. | If the equation have a common root, where are the lengths of the sides of a , then is equal to | | | | | | | |
|  | a) | 1 | b) |  | c) |  | d) | 2 |
| 1032. | If is a complex cube root of unity, then | | | | | | | |
|  | a) | 0 | b) | 6 | c) | 64 | d) | 128 |
| 1033. | If , then is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | None of these |
| 1034. | Let be positive numbers. The following system of equations in and has | | | | | | | |
|  | a) | No solution | | | b) | Unique solution | | |
|  | c) | Infinitely many solutions | | | d) | Finitely may solutions | | |
| 1035. | If , then the value of is | | | | | | | |
|  | a) |  | b) | 1 | c) |  | d) |  |
| 1036. | If are the roots of unity, then the value of is equal to | | | | | | | |
|  | a) |  | b) |  | c) |  | d) | 0 |
| 1037. | If , then is (where is complex conjugate of ) | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |
| 1038. | The roots of the equation  are | | | | | | | |
|  | a) |  | b) |  | c) |  | d) |  |

**ACTIVE SITE TUTORIALS**

**Date :** 24-07-2019 **TEST ID: 209**

**Time :** 34:36:00 **MATHEMATICS**

**Marks :** 4152

5.COMPLEX NUMBERS AND QUADRATIC EQUATIONS

|  |
| --- |
| **: ANSWER KEY :** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **1) c 2) b 3) c 4) c**  **5) c 6) c 7) a 8) b**  **9) b 10) b 11) b 12) b**  **13) c 14) a 15) d 16) a**  **17) c 18) a 19) a 20) c**  **21) b 22) a 23) d 24) c**  **25) c 26) b 27) c 28) c**  **29) d 30) b 31) c 32) a**  **33) a 34) b 35) b 36) a**  **37) b 38) c 39) a 40) b**  **41) c 42) c 43) c 44) a**  **45) b 46) b 47) c 48) a**  **49) c 50) c 51) b 52) a**  **53) c 54) d 55) a 56) b**  **57) c 58) c 59) c 60) d**  **61) d 62) c 63) b 64) d**  **65) b 66) a 67) a 68) a**  **69) c 70) d 71) d 72) d**  **73) d 74) c 75) a 76) b**  **77) a 78) a 79) b 80) a**  **81) c 82) a 83) d 84) a**  **85) a 86) b 87) d 88) b**  **89) a 90) c 91) a 92) a**  **93) d 94) c 95) c 96) b**  **97) b 98) b 99) b 100) d**  **101) b 102) d 103) a 104) a**  **105) a 106) c 107) c 108) b**  **109) b 110) a 111) d 112) b**  **113) d 114) a 115) c 116) c**  **117) a 118) b 119) a 120) a**  **121) a 122) d 123) d 124) a**  **125) c 126) b 127) a 128) d**  **129) c 130) d 131) a 132) c**  **133) c 134) a 135) a 136) d**  **137) d 138) c 139) b 140) d**  **141) b 142) d 143) d 144) d**  **145) a 146) b 147) d 148) d**  **149) d 150) d 151) a 152) b**  **153) d 154) d 155) a 156) a**  **157) a 158) d 159) c 160) b**  **161) b 162) b 163) d 164) d**  **165) b 166) b 167) c 168) c**  **169) b 170) a 171) c 172) a**  **173) d 174) a 175) b 176) a**  **177) a 178) d 179) c 180) d**  **181) c 182) a 183) b 184) b**  **185) d 186) c 187) a 188) b**  **189) d 190) d 191) b 192) d**  **193) c 194) c 195) c 196) b**  **197) d 198) a 199) d 200) c**  **201) a 202) c 203) d 204) a**  **205) d 206) a 207) a 208) b**  **209) d 210) a 211) a 212) c**  **213) c 214) d 215) b 216) d**  **217) b 218) a 219) d 220) c**  **221) c 222) c 223) a 224) b**  **225) b 226) a 227) b 228) b**  **229) c 230) c 231) a 232) c**  **233) a 234) a 235) d 236) a**  **237) b 238) c 239) d 240) d**  **241) b 242) c 243) b 244) b**  **245) a 246) a 247) a 248) c**  **249) d 250) d 251) b 252) d**  **253) b 254) d 255) c 256) b**  **257) b 258) d 259) a 260) b**  **261) c 262) d 263) a 264) b**  **265) c 266) a 267) c 268) b**  **269) c 270) c 271) d 272) b**  **273) c 274) a 275) d 276) b**  **277) a 278) b 279) a 280) a**  **281) c 282) a 283) b 284) a**  **285) b 286) b 287) d 288) c**  **289) b 290) c 291) b 292) c**  **293) c 294) b 295) b 296) b**  **297) c 298) b 299) a 300) b**  **301) d 302) a 303) b 304) a**  **305) a 306) b 307) a 308) a**  **309) d 310) d 311) d 312) d**  **313) b 314) c 315) c 316) b**  **317) c 318) c 319) b 320) b**  **321) d 322) b 323) a 324) c**  **325) a 326) d 327) b 328) d**  **329) a 330) a 331) d 332) b**  **333) c 334) a 335) b 336) b**  **337) a 338) b 339) d 340) d**  **341) c 342) b 343) b 344) d**  **345) a 346) a 347) b 348) b**  **349) a 350) c 351) b 352) a**  **353) b 354) c 355) a 356) a**  **357) b 358) b 359) d 360) b**  **361) b 362) d 363) d 364) d**  **365) a 366) d 367) a 368) c**  **369) b 370) b 371) d 372) a**  **373) b 374) b 375) d 376) c**  **377) d 378) b 379) d 380) b**  **381) d 382) c 383) a 384) b**  **385) c 386) b 387) d 388) a**  **389) b 390) c 391) a 392) b**  **393) b 394) b 395) a 396) b**  **397) d 398) d 399) b 400) c**  **401) d 402) d 403) b 404) b**  **405) a 406) c 407) a 408) c**  **409) d 410) c 411) b 412) b**  **413) c 414) a 415) b 416) b**  **417) a 418) d 419) a 420) a**  **421) a 422) c 423) a 424) a**  **425) b 426) d 427) b 428) d**  **429) c 430) d 431) a 432) a**  **433) a 434) d 435) a 436) b**  **437) b 438) a 439) c 440) d**  **441) a 442) b 443) d 444) a**  **445) c 446) c 447) a 448) c**  **449) d 450) b 451) c 452) a**  **453) c 454) d 455) c 456) b**  **457) d 458) a 459) c 460) c**  **461) d 462) a 463) d 464) a**  **465) b 466) b 467) b 468) a**  **469) c 470) d 471) c 472) d**  **473) a 474) c 475) a 476) a**  **477) d 478) c 479) b 480) b**  **481) a 482) c 483) c 484) b**  **485) c 486) a 487) a 488) b**  **489) c 490) c 491) c 492) a**  **493) c 494) a 495) b 496) b**  **497) c 498) c 499) b 500) a**  **501) b 502) b 503) d 504) d**  **505) c 506) a 507) d 508) c**  **509) a 510) d 511) a 512) b**  **513) b 514) a 515) c 516) d**  **517) b 518) d 519) c 520) c**  **521) a 522) c 523) a 524) c**  **525) a 526) c 527) d 528) d**  **529) a 530) c 531) b 532) b**  **533) a 534) d 535) d 536) d**  **537) d 538) d 539) d 540) d**  **541) c 542) c 543) c 544) a**  **545) c 546) a 547) a 548) c**  **549) b 550) d 551) c 552) d**  **553) b 554) c 555) a 556) d**  **557) d 558) b 559) d 560) d**  **561) d 562) b 563) b 564) d**  **565) b 566) a 567) b 568) d**  **569) c 570) d 571) a 572) c**  **573) b 574) c 575) b 576) b**  **577) c 578) c 579) b 580) b**  **581) a 582) b 583) b 584) a**  **585) d 586) c 587) c 588) a**  **589) d 590) c 591) b 592) a**  **593) d 594) a 595) d 596) c**  **597) c 598) b 599) b 600) b**  **601) d 602) d 603) a 604) b**  **605) b 606) b 607) c 608) b**  **609) b 610) c 611) c 612) b**  **613) b 614) c 615) c 616) c**  **617) c 618) b 619) a 620) b**  **621) b 622) c 623) d 624) d**  **625) c 626) c 627) b 628) d**  **629) b 630) b 631) b 632) b**  **633) d 634) c 635) d 636) a**  **637) b 638) c 639) b 640) b**  **641) b 642) d 643) a 644) a**  **645) a 646) b 647) b 648) b**  **649) c 650) a 651) d 652) c**  **653) d 654) a 655) c 656) c**  **657) c 658) d 659) c 660) b**  **661) b 662) c 663) d 664) d**  **665) b 666) b 667) c 668) b**  **669) d 670) a 671) c 672) b**  **673) c 674) a 675) b 676) d**  **677) a 678) d 679) b 680) b**  **681) d 682) a 683) a 684) b**  **685) b 686) b 687) b 688) b**  **689) a 690) b 691) d 692) b**  **693) a 694) d 695) a 696) d**  **697) a 698) a 699) a 700) c**  **701) b 702) b 703) a 704) b**  **705) b 706) d 707) b 708) c**  **709) c 710) d 711) c 712) a**  **713) a 714) a 715) d 716) c**  **717) b 718) d 719) c 720) d**  **721) c 722) c 723) b 724) d**  **725) a 726) a 727) c 728) d**  **729) a 730) c 731) a 732) c**  **733) a 734) b 735) d 736) a**  **737) a 738) c 739) d 740) b**  **741) d 742) a 743) d 744) b**  **745) d 746) b 747) a 748) b**  **749) d 750) c 751) c 752) b**  **753) d 754) c 755) d 756) c**  **757) c 758) c 759) b 760) c**  **761) b 762) b 763) c 764) c**  **765) a 766) b 767) d 768) b**  **769) b 770) d 771) d 772) a**  **773) a 774) a 775) b 776) c**  **777) b 778) a 779) c 780) a**  **781) c 782) c 783) c 784) a**  **785) c 786) d 787) b 788) a**  **789) b 790) a 791) b 792) a**  **793) a 794) b 795) a 796) b**  **797) c 798) b 799) a 800) a**  **801) a 802) a 803) a 804) b**  **805) a 806) a 807) b 808) a**  **809) b 810) c 811) b 812) a**  **813) c 814) d 815) c 816) d**  **817) b 818) d 819) b 820) c**  **821) a 822) d 823) b 824) d**  **825) c 826) a 827) c 828) a**  **829) b 830) d 831) c 832) d**  **833) d 834) b 835) a 836) a**  **837) d 838) a 839) c 840) c**  **841) d 842) b 843) a 844) c**  **845) c 846) a 847) a 848) c**  **849) b 850) c 851) c 852) c**  **853) c 854) d 855) c 856) b**  **857) d 858) b 859) a 860) d**  **861) a 862) c 863) a 864) c**  **865) b 866) d 867) b 868) a**  **869) c 870) b 871) b 872) b**  **873) d 874) c 875) c 876) d**  **877) a 878) b 879) d 880) a**  **881) b 882) d 883) a 884) b**  **885) a 886) a 887) d 888) c**  **889) a 890) c 891) c 892) d**  **893) c 894) d 895) c 896) c**  **897) a 898) a 899) a 900) a**  **901) b 902) c 903) d 904) a**  **905) d 906) c 907) d 908) d**  **909) c 910) d 911) b 912) a**  **913) c 914) b 915) b 916) d**  **917) b 918) b 919) b 920) a**  **921) c 922) a 923) b 924) b**  **925) c 926) a 927) b 928) b**  **929) b 930) c 931) c 932) a**  **933) a 934) c 935) c 936) a**  **937) b 938) d 939) b 940) d**  **941) b 942) d 943) d 944) a**  **945) c 946) c 947) d 948) a**  **949) a 950) c 951) b 952) b**  **953) d 954) a 955) b 956) a**  **957) a 958) c 959) c 960) d**  **961) a 962) b 963) a 964) a**  **965) c 966) a 967) d 968) a**  **969) c 970) a 971) a 972) a**  **973) c 974) c 975) a 976) a**  **977) a 978) c 979) c 980) b**  **981) b 982) d 983) b 984) a**  **985) b 986) c 987) d 988) a**  **989) a 990) b 991) d 992) d**  **993) d 994) a 995) d 996) d**  **997) c 998) b 999) a 1000) b**  **1001) c 1002) a 1003) d 1004) d**  **1005) d 1006) b 1007) c 1008) d**  **1009) c 1010) a 1011) b 1012) c**  **1013) a 1014) d 1015) a 1016) b**  **1017) d 1018) d 1019) a 1020) d**  **1021) a 1022) a 1023) a 1024) d**  **1025) d 1026) d 1027) b 1028) b**  **1029) c 1030) d 1031) d 1032) d**  **1033) a 1034) d 1035) d 1036) c**  **1037) d 1038) b** | | | | |

**ACTIVE SITE TUTORIALS**

**Date :** 24-07-2019 **TEST ID: 209**

**Time :** 34:36:00 **MATHEMATICS**

**Marks :** 4152

5.COMPLEX NUMBERS AND QUADRATIC EQUATIONS

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| **: HINTS AND SOLUTIONS :** |

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| 1 | **(c)**  Let | | | | | | | |
| 2 | **(b)**  Let each ratio be and let ,  Then  And | | | | | | | |

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| --- | --- |
| 3 | **(c)**  Let Then, coordinates of the vertices of the triangle are and  Area of the triangle |

|  |  |  |  |  |  |  |  |  |
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| 4 | **(c)**  Given, | | | | | | | |
| 5 | **(c)**  We have,  locus of is the perpendicular bisector of | | | | | | | |
| 7 | **(a)**  We have,  By componendo and dividendo  or  and  [this is obviously true]  The condition is  or  or | | | | | | | |
| 9 | **(b)**  Since,  Given that, has complex roots | | | | | | | |
| 10 | **(b)**  Given,  As we know, if roots are equal in magnitude but opposite in sign, then coefficient of will be zero | | | | | | | |
| 11 | **(b)**  We have,  Following cases arise:  CASE I  In this case, we have  and  But, So, there is no solution in this case  CASE II  In this case, we have  and  Therefore,  CASE III  In this case, we have  and  But, Therefore,  Hence, the solution set is | | | | | | | |
| 12 | **(b)**  Let the correct equation is  ,  Then  When is written incorrectly, then the roots are equal.  Let these are and .  …(i)  When is written icorrectly, then the roots are and 2.  [from Eq. (i)] | | | | | | | |
| 13 | **(c)**  Let  Since, is complex number | | | | | | | |
| 14 | **(a)**  Given, are real, has two real roots and , where and  and  and  and | | | | | | | |
| 15 | **(d)**  Let the correct equation be and the correct roots are . Taking wrong, the roots are 3 and 2.  ...(i)  Also,  ...(ii)  On solving Eqs.(i) and (ii), the correct roots are 6 and . | | | | | | | |
| 16 | **(a)**  Since, 1 is root of  is true  Since, are the roots of  And  Hence, and both are true | | | | | | | |
| 17 | **(c)** | | | | | | | |
| 18 | **(a)** | | | | | | | |
| 19 | **(a)**  Given equation  Since, roots are  Product of roots,  Again, since roots are real.  Thus, the least value of is 2. | | | | | | | |
| 20 | **(c)**  If 1,2, 3, 4 are the roots of given equation, then  Alternate  Since, 1, 2, 3 and 4 are the roots of the equation  , then  ...(i)  ...(ii)  ...(iii)  And ...(iv)  On solving Eqs. (i), (ii), (iii) and (iv), we get  Now, | | | | | | | |
| 21 | **(b)**  We have,  So, there are three integral values viz. | | | | | | | |
| 22 | **(a)**  Let the roots be and Then,    Hence, the greatest value of is | | | | | | | |
| 23 | **(d)**  Let  Since, given number lies in IIIrd quadrant | | | | | | | |
| 24 | **(c)**  Let  Then,  and  If be the area of the triangle formed by and , then  Applying  Then  (given) | | | | | | | |
| 25 | **(c)**  Given has imaginary roots  ...(i)  Let  Here,  So, the given expression has a minimum value  Minimum value  [from Eq. (i)] | | | | | | | |
| 26 | **(b)**  Given,  or  Since, is rational, then the discriminant of the above equation must be a perfect square.    Must be a perfect square | | | | | | | |
| 27 | **(c)** | | | | | | | |
| 28 | **(c)**  Let and  Then,  Hence, area of triangle is zero, therefore points are collinear | | | | | | | |
| 29 | **(d)**  We have,  Given, | | | | | | | |
| 30 | **(b)** | | | | | | | |
| 31 | **(c)**  Since are roots of  We have,  Thus, the equation whose roots are is | | | | | | | |
| 32 | **(a)**  The required vector is given by | | | | | | | |
| 33 | **(a)**  Given, [let ]  , where | | | | | | | |
| 34 | **(b)**  Since is real, we must have  for all  or, | | | | | | | |
| 35 | **(b)**  Let  Since is a factor of Therefore, is a factor of and is a factor of  and  and  Hence, is the other factor of | | | | | | | |
| 36 | **(a)**  Required vertices are given by | | | | | | | |
| 37 | **(b)**  Let all four roots are imaginary. Then roots of both equation are imaginary.  Thus, .  So, if at least two roots must be real, if we have the equations  and  or must be positive so two roots must be real. | | | | | | | |
| 38 | **(c)** | | | | | | | |
| 39 | **(a)**  Let,  So, minimum value of .  Since, | | | | | | | |
| 41 | **(c)**  We have,  This is a quadratic equation in , therefore roots are or  Let  or  or  or  It represents a pair of straight lines | | | | | | | |
| 42 | **(c)**  Clearly, represeents a circle having centre at and radius 1. Let be a point on the circle such that | | | | | | | |
| 43 | **(c)**  We have,  Where and | | | | | | | |
| 44 | **(a)**  We have,  Hence, the given expression is always non-negative | | | | | | | |
| 45 | **(b)**  Let be the centres of circles and respectively. Let be the centre of the variable circle which touches the given circles externally. Then,  and  Locus of is a hyperbola having its foci at and respectively | | | | | | | |
| 46 | **(b)**  Let  Modulus and amplitude | | | | | | | |
| 47 | **(c)**  We have, | | | | | | | |
| 48 | **(a)** | | | | | | | |
| 49 | **(c)**  We know  ) | | | | | | | |
| 50 | **(c)**  Given, | | | | | | | |
| 51 | **(b)** | | | | | | | |
| 52 | **(a)**  Given equation is …(i)  or  Since is real.  Eq. (i) can also be written as  Since is real. | | | | | | | |
| 53 | **(c)**  Let be the roots of the equation  Then,  Product of the roots | | | | | | | |
| 54 | **(d)**  We have,  Taking log on both sides, we get | | | | | | | |
| 55 | **(a)**  Using the given equation reduces to  Clearly, is a root of this equation  Let be its discriminant. Then,    Hence, the roots are real and unequal | | | | | | | |
| 56 | **(b)**  We have, and  Now, | | | | | | | |
| 57 | **(c)**  We have,  Let be the roots of this equation. Then,  and  If one root is less than then the other root is greater than  One root lies in and the other is in  ALITER Clearly, and are the roots of the equation  Therefore, the curve opens upward and cuts -axis at and  The curve is obtained by translating through one unit in vertically downward direction. So, it will cross -axis at two points one lying on the left of and other one the right of  Hence, one of the roots lies in and other in | | | | | | | |
| 58 | **(c)** | | | | | | | |
| 59 | **(c)** | | | | | | | |
| 60 | **(d)**  Let  Now,  It is not possible  Hence, square root is not possible | | | | | | | |
| 61 | **(d)**  We have,  Two cases arise  CASE I  In this case, we have  But, Therefore,  CASE II  In this case, we have  This is true for all  Hence, i.e.  ALITER Draw the graphs of and  Clearly, for all | | | | | | | |
| 62 | **(c)**  We have,  and | | | | | | | |
| 63 | **(b)**  We have, | | | | | | | |
| 64 | **(d)**  If , multiplying each term by the given equation reduces to or or , which is not possible as considering , thus given equation has no roots | | | | | | | |
| 65 | **(b)**  Given,  The smallest value of is 2 | | | | | | | |
| 66 | **(a)**  Since, is purely imaginary | | | | | | | |
| 67 | **(a)**  Let the vertex be then and can be obtained by rotating through and respectively    Thus, and,  and,  and,  Thus, vertices and are represented by | | | | | | | |
| 68 | **(a)**  Let be the roots of the given quadratic equation. Then,  It is given that  are in A.P.  Dividing both sides of by we get | | | | | | | |
| 69 | **(c)**  Clearly, angle between and is a right angle | | | | | | | |
| 70 | **(d)**  We have, | | | | | | | |
| 71 | **(d)**  Since, the equation has roots and the equation has roots  and and  and | | | | | | | |
| 72 | **(d)**  We have, | | | | | | | |
| 73 | **(d)**  We have,  For we have  For we have | | | | | | | |
| 74 | **(c)**  Let  For purely imaginary of , put Re | | | | | | | |
| 75 | **(a)**  We have,  for all  [Using: discriminant ] | | | | | | | |
| 76 | **(b)**  Let Then,  is real  is real  …(i)  is real  is real  Using (i) | | | | | | | |
| 77 | **(a)**  Let Then,  which is a circle | | | | | | | |
| 78 | **(a)**  (where is a non-real root of unity)  Locus of is a pair of straight lines  and  or  Also, | | | | | | | |
| 79 | **(b)**  Diagonals of parallelogram are bisected each other at a point , | | | | | | | |
| 80 | **(a)**  Now,  Where  On comparing the coefficient of and constant terms, we get  and  and | | | | | | | |
| 81 | **(c)**  We have, …(i)  Let  [from Eq. (i)]  Hence, roots are real. | | | | | | | |
| 82 | **(a)**  Given, ...(i)  Given, | | | | | | | |
| 83 | **(d)**  We have,  But for is not meaningful.  It has no root. | | | | | | | |
| 84 | **(a)**  We have, | | | | | | | |
| 85 | **(a)**  Let be the roots of and be the roots of Then,  It is given that | | | | | | | |
| 86 | **(b)**  Put | | | | | | | |
| 87 | **(d)**  Since implies lies on or inside a circle with centre and radius we have | | | | | | | |
| 88 | **(b)** | | | | | | | |
| 89 | **(a)**  We have,  …(i)  …(ii)  …(iii)  and, …(iv)  From (i) and (iii), we have  From (ii) and (iv), we have  From (i) and (iv), we have  From (i), we have  Also,  From (iv), we have  Also,  Hence, the largest and the smallest numbers are and respectively | | | | | | | |
| 90 | **(c)**  We have, | | | | | | | |
| 91 | **(a)**  Let be the common ratio of the GP. Since are in GP, then .  For equations,  ….(i)  and  ...(ii)  For equation,  ...(iii)  and  ...(iv)  On dividing Eq. (iii) by Eq. (i),we get  If we take , then is not integral, so we take  Substituting in Eq. (i), we get  Now, from Eq. (ii), we have  and from Eq. (iv), we have | | | | | | | |
| 92 | **(a)**  Let the vertices of triangle be and  Given,  Now,  and  is an equilateral triangle. | | | | | | | |
| 93 | **(d)**  We have, | | | | | | | |
| 94 | **(c)**  Let  Given, | | | | | | | |
| 95 | **(c)**  Let be the roots of the equation Then,  and,  and  and | | | | | | | |
| 96 | **(b)**  We have,  But is not defined at | | | | | | | |
| 97 | **(b)**  As sum of any four consecutive powers of iota is zero | | | | | | | |
| 98 | **(b)**  The complex cube roots of unity are  Let  Then, | | | | | | | |
| 99 | **(b)**  Since are in H.P.  Now,  Hence, roots of the given equation are imaginary | | | | | | | |
| 100 | **(d)**  The two circle whose centre and radius are = and it passes through origin , the centre of  D:\Common Folder\Data Typing Files\Sujata\scan\scan\Untitled-1.jpg  Now,  And  Hence, circle lies inside the circle  From figure the minimum distance between them, is | | | | | | | |
| 101 | **(b)**  Since, be the roots of the equation , therefore  and  From second relation  Hence, and | | | | | | | |
| 102 | **(d)**  The equation has no real root, because LHS is always positive while RHS is zero | | | | | | | |
| 103 | **(a)**  Let Then,  Since is purely imaginary. Therefore,    ALITER We have,  lies on the circle | | | | | | | |
| 104 | **(a)**  Let be the fourth vertex of parallelogram, then | | | | | | | |
| 105 | **(a)**  Let | | | | | | | |
| 106 | **(c)**  Let  Then,  or | | | | | | | |
| 107 | **(c)**  We have,  lies within a circle | | | | | | | |
| 108 | **(b)**  Here,  ...(i)  Now,    On putting this value in Eq. (i) , we get | | | | | | | |
| 109 | **(b)**  Given,  [squaring]  The quadratic equation having the roots and is | | | | | | | |
| 110 | **(a)**  Replacing by we get the required equation | | | | | | | |
| 111 | **(d)** | | | | | | | |
| 112 | **(b)**  Let and be the roots of the equation, then  and  On eliminating , we get | | | | | | | |
| 113 | **(d)**  Let  …(i)  …(ii)  from Eqs.(i)and (ii)we get | | | | | | | |
| 114 | **(a)**  Let  Put we get  Products of roots  Alternate Method  We know that the cube roots of -1 are -1, -  Their product | | | | | | | |
| 115 | **(c)**  Sum of the roots  From the given options only (c) satisfies this condition | | | | | | | |
| 116 | **(c)**  If is an identity in then  and must holdgood simultaneously.  Clearly, is the value of which satisfies these equations | | | | | | | |
| 117 | **(a)**  Since and can be obtained by rotating vector representing through and respectively  and | | | | | | | |
| 118 | **(b)**  We have, | | | | | | | |
| 119 | **(a)**  LHS is always positive while RHS is always negative. Hence, the given equation has no solution. | | | | | | | |
| 120 | **(a)**  Let root of be , then  According to the given condition, | | | | | | | |
| 121 | **(a)**  CASE I  In this case, we have    CASE II  In this case, we have | | | | | | | |
| 122 | **(d)**  Given, | | | | | | | |
| 123 | **(d)**  We have,  Hence, | | | | | | | |
| 124 | **(a)**  It is given that and are the roots of the equation  and  The LHS of choice (a) can be written as  So, option (a) is correct | | | | | | | |
| 125 | **(c)**  =2 sin | | | | | | | |
| 126 | **(b)**  We know that, sum of any four consecutive powers of is zero | | | | | | | |
| 127 | **(a)** | | | | | | | |
| 128 | **(d)**  We have, | | | | | | | |
| 129 | **(c)**  Let be the roots of the equation  Then, and  Now, | | | | | | | |
| 130 | **(d)**  Let be a common root of the equations and Then,  and,  Adding and subtracting these two equations, we get  and | | | | | | | |
| 131 | **(a)**  We have,  where is the origin    Circumcentre of is at the origin  But, the triangle is equilateral. Therefore , its centroid coincides with the circumcentre  Thus,  Clearly, and  Let be along -axis such that unit. Then,  Hence,  Thus, we have | | | | | | | |
| 132 | **(c)**  We have, | | | | | | | |
| 133 | **(c)**  Since, are the roots of the equation , then  ...(i)  and are the roots of .  Then, …(ii)  and  If is discriminant of the equation ,  Then  [from Eqs. (i) and (ii)]  Hence, the equation has always two real roots. | | | | | | | |
| 134 | **(a)**  Since, and are the sides of a , then  Similarly,  On adding, we get  Also,  From Eqs. (i) and (ii), | | | | | | | |
| 135 | **(a)**  Let be the vertex with affix . There are two possibilities of can be obtained by rotating through either in clockwise or in anti-clockwise direction. | | | | | | | |
| 136 | **(d)**  Given, | | | | | | | |
| 137 | **(d)**  We have,  For to be non-real, we must have  Now, origin and points representing and will form an equilateral triangle in the argand plane, if  Clearly, satisfies the condition  Hence, | | | | | | | |
| 138 | **(c)**  Let represent complex numbers respectively, then  moves in such a way that the sum of its distance from two fixed points is always less than or equal to 4  Locus of is the interior and boundary of ellipse having foci at (1, 0) and (-1, 0) | | | | | | | |
| 139 | **(b)**  On comparing the given circle with , we get  Radius | | | | | | | |
| 140 | **(d)**  We have,  Thus, the vertices and of are respectively,  Clearly, | | | | | | | |
| 141 | **(b)**  Given,  Let | | | | | | | |
| 142 | **(d)**  Let the vertices be w.r.t. centre O at origin and  \\SERVER\Common Folder\Data Typing Files\Sujata\AIEEE Maths all structures\2. sol I 59  (i)  Similarly,  Hence, the perimeter of regular hexagon | | | | | | | |
| 143 | **(d)**  Let , then by using De Moivre’s theorem  …(i)  Let    [from Eq.(i)]  It is GP of which the first term is number of terms is 6 and the common ratio is | | | | | | | |
| 144 | **(d)**  Let be the roots of the given equation  And  Let the required cubic equation has the roots and .  And  Required equation is | | | | | | | |
| 145 | **(a)**  Since,  or  or  or | | | | | | | |
| 146 | **(b)**  Since, are the roots of equation .  Here, . So, roots are real and unequal.  Now, and  One root is positive and the other is negative, the negative root being numerically bigger. As is the negative root while is the positive root. So, and . | | | | | | | |
| 147 | **(d)**  Given,  And  Hence, | | | | | | | |
| 148 | **(d)**  We have,  CASE I  In this case, we have  CASE II  In this case, we have    Hence, the roots are | | | | | | | |
| 149 | **(d)**  We have,  Now,  Hence, | | | | | | | |
| 150 | **(d)**  We have, | | | | | | | |
| 151 | **(a)**  Here, and  Now, | | | | | | | |
| 152 | **(b)**  Since, 4is a root of  Let the roots of the equation be and  And | | | | | | | |
| 153 | **(d)** | | | | | | | |
| 154 | **(d)**  We have,  So, there is no non-zero integral solution of the given equation | | | | | | | |
| 155 | **(a)**  We have the following cases:  CASE I  In this case, we have  But, So, the equation has no solution in this case.  CASE II  In this case, we have  Hence, the given equation has only one solution | | | | | | | |
| 156 | **(a)**  We have,  lies on the perpendicular bisector of the segment joing and () | | | | | | | |
| 157 | **(a)**  Given,  [1+ and | | | | | | | |
| 158 | **(d)**  We have, | | | | | | | |
| 159 | **(c)**  Since are vertices of an equilateral triangle | | | | | | | |
| 160 | **(b)**  As we know,  Using number line rule | | | | | | | |
| 161 | **(b)**  Given that are the roots of the equation , then  and …(i)  Now, are the roots of , then  and …(ii)  Given system is and .  Now,  …(iii)  Since,  (on adding 1 on both sides)  On substituting the values from Eqs. (i), (ii) and (iii), we get | | | | | | | |
| 162 | **(b)**  … upto  … upto  … upto  …. upto  [×…upto n] | | | | | | | |
| 163 | **(d)**  Given, and are different complex numbers and | | | | | | | |
| 164 | **(d)** | | | | | | | |
| 165 | **(b)**  We have, | | | | | | | |
| 166 | **(b)** | | | | | | | |
| 167 | **(c)**  We have,  for all  So, has no real root | | | | | | | |
| 168 | **(c)**  Given, are the roots of  ...(i)  And ...(ii)  Now,  ...(iii)  On solving Eqs. (i) and (ii0, we get  And  Now, | | | | | | | |
| 169 | **(b)**  We have,  Hence, greatest and least values of are 6 and 0 respectively | | | | | | | |
| 170 | **(a)**  Let be any point on the circle | | | | | | | |
| 171 | **(c)**  It is given that be a factor of given by | | | | | | | |
| 172 | **(a)**  Let Then,  and  and  is a root of | | | | | | | |
| 173 | **(d)**  Here, and  Now, | | | | | | | |
| 174 | **(a)**  We have,    Let | | | | | | | |
| 175 | **(b)**  Since are the roots of the equation and are the roots of the equation  ,  and …(i)  Also, and  [Using (i)] | | | | | | | |
| 176 | **(a)**  Since, | | | | | | | |
| 177 | **(a)** | | | | | | | |
| 178 | **(d)**  Let  If has distinct roots between 0 and 1. Then,  has a root between 0 and 1  But,  Clearly, does not have any root between 0 and 1.  So, does not have distinct roots between 0 and 1 for any value of | | | | | | | |
| 179 | **(c)**  It is given that are the roots of the equation | | | | | | | |
| 180 | **(d)**  We have, | | | | | | | |
| 181 | **(c)**  Let be the roots of the equation Then,  …(i)  Again,  [Using (i)] | | | | | | | |
| 182 | **(a)**  Let two consecutive integers and be the roots of . Then, and | | | | | | | |
| 183 | **(b)**  Given, (say)  Again as, are in GP, so | | | | | | | |
| 184 | **(b)**  Let and be the vertices of the triangle. The triangle is an equilateral triangle | | | | | | | |
| 185 | **(d)**  We have, | | | | | | | |
| 186 | **(c)**  Since, ...(i)  Now, discriminant,  [from Eq. (i)]  Roots of the given equation are rational and distinct | | | | | | | |
| 187 | **(a)**  We have,  lies on the right side of the perpendicular bisector of the segment joining (0, 0) and | | | | | | | |
| 189 | **(d)**  Since,  or  or  The given equation has four real roots | | | | | | | |
| 190 | **(d)**  Let 4 and be roots of given equation  And  Equation will reduce to  Let this equation have as its roots  and | | | | | | | |
| 191 | **(b)** | | | | | | | |
| 192 | **(d)**  We have,  and  Now,  Sum of the roots  Product of the roots  Hence, required equation is  ALITER Required equation can be obtained by replacing by in the given equation | | | | | | | |
| 193 | **(c)**  Given, …(i)  [From Eq. (i)]  or  or | | | | | | | |
| 194 | **(c)**  We have,  Since, Therefore,  Hence, | | | | | | | |
| 195 | **(c)**  Let be a common root of the two equations. Then,  Clearly, satisfy this equation | | | | | | | |
| 196 | **(b)**  We know that are roots of Therefore, will be exactly divisible by if are its roots  For we have  provided that are integers  Similarly, will be a root of if are integers | | | | | | | |
| 197 | **(d)** | | | | | | | |
| 198 | **(a)**  Since, and are the roots of equation  And  Now, | | | | | | | |
| 199 | **(d)**  Given,  [put ]  and  and | | | | | | | |
| 200 | **(c)**  Here, and  and | | | | | | | |
| 201 | **(a)**  which is not possible  Hence, no real roots exist | | | | | | | |
| 202 | **(c)**  Let be the discriminant of the given quadratic.  Then,    Hence, the roots are real | | | | | | | |
| 203 | **(d)**  Let Then, | | | | | | | |
| 204 | **(a)**  Given, | | | | | | | |
| 205 | **(d)** | | | | | | | |
| 206 | **(a)**  Let be the roots of  are roots of  Let be the discriminant of Then,  So, the given equation has real roots | | | | | | | |
| 207 | **(a)**  Let  Here, as is real | | | | | | | |
| 208 | **(b)**  Now, for new equation, | | | | | | | |
| 209 | **(d)** | | | | | | | |
| 210 | **(a)**  We have  On putting , we get  On putting , we get  On putting , we get  Now, | | | | | | | |
| 211 | **(a)**  The given equation is  or  Now,  and  Also,  Hence, required root is | | | | | | | |
| 212 | **(c)**  Using triangle inequality, we have  Hence, the minimum value of is 2 | | | | | | | |
| 214 | **(d)**  We have,  where | | | | | | | |
| 215 | **(b)**  We have,  For ...(i)  For ...(ii)  On solving Eqs. (i) and (ii), we get | | | | | | | |
| 216 | **(d)**  Let be roots of and be roots of Then,  and  Now, | | | | | | | |
| 217 | **(b)**  We have,  and | | | | | | | |
| 218 | **(a)**  We have,  Clearly, is a root of this equation. It is given that the equation has equal roots. So, both the roots are equal to 1  Product of the roots  are in H.P. | | | | | | | |
| 219 | **(d)**  Let be the roots of the equation Then,  and  Clearly, it is least when | | | | | | | |
| 220 | **(c)**  We know that | | | | | | | |
| 221 | **(c)**  We have,  Clearly, and 3 satisfy this equation | | | | | | | |
| 222 | **(c)**  Solving the given equation, we get  or, | | | | | | | |
| 223 | **(a)**  Since, are the roots of the equation  Here, ...(i)  ...(ii)  And ...(iii)  On squaring Eq. (i), we get  [from Eq. (ii)] | | | | | | | |
| 224 | **(b)**  Here,  Clearly  Therefore, are collinear points  ALITER We have,  divides the segment joining and in the ratio  are collinear | | | | | | | |
| 225 | **(b)**  Let the roots be and Then, | | | | | | | |
| 226 | **(a)**  We have,  Locus of is a circle | | | | | | | |
| 227 | **(b)**  Given, and  and  Since,  and  and  Now,  And  Required equation is | | | | | | | |
| 228 | **(b)**  We have, | | | | | | | |
| 229 | **(c)**  Let and be discriminates of and respectively. Then,  Now, either or  If then Therefore, roots of are real  If then Therefore, roots of are real.  Thus, has at least two real roots | | | | | | | |
| 230 | **(c)**  represents the interior and boundary of the circle with centre at (-4, 0) and radius=3. As -1 is an end point of a diameter of the circle, maximum possible value of is 6  D:\Common Folder\Data Typing Files\Sujata\scan\scan\maths 16.jpg  **Alternate**  Hence, maximum value of is 6 | | | | | | | |
| 231 | **(a)**  Given, and  And  and | | | | | | | |
| 232 | **(c)**  Since, be the roots of the equation , then  Now, sum of roots      and product of roots  Hence, required equation is | | | | | | | |
| 233 | **(a)**  Here,  Let  Now,  and  now, let and be the magnitude and angle of resultant complex number.  According to question.  and  Hence, new complex number will be | | | | | | | |
| 234 | **(a)**  We have, | | | | | | | |
| 235 | **(d)**  Given equation is  Let  2 | | | | | | | |
| 236 | **(a)**  We have, | | | | | | | |
| 237 | **(b)**  Given, and  Since, represents circle having centre at and radius  Then, lies on the circle having infinite points  Hence, represents infinite sets | | | | | | | |
| 238 | **(c)**  Given,  This represents the equation of a circle | | | | | | | |
| 239 | **(d)** | | | | | | | |
| 240 | **(d)**  Here, and  Now,  And  Required equation is | | | | | | | |
| 241 | **(b)**  It is given that the equations and have real roots  and | | | | | | | |
| 242 | **(c)**  We have,  or, | | | | | | | |
| 243 | **(b)**  We have,  Here two cases arise.  Case I When  is not satisfying the condition . So is the only solution of the given equation.  Case II When  Hence, satisfy the given condition.  Since, while is not satisfying the condition. Thus, number of real solutions are two. | | | | | | | |
| 244 | **(b)**  We have,  -axis | | | | | | | |
| 245 | **(a)**  Let Then,  Thus, represents a pair of straight lines | | | | | | | |
| 246 | **(a)**  Given,  , then lies on the axis of . | | | | | | | |
| 247 | **(a)**  Since is a root of Therefore, is also its root  Now,  Sum of the roots  and, Product of the roots | | | | | | | |
| 248 | **(c)**  We have,  On squaring both sides, we get  =5  Again on squaring both sides, we get | | | | | | | |
| 249 | **(d)**  Given, | | | | | | | |
| 250 | **(d)**  Let are the roots of the equation .  …(i)  and …(ii)  Roots are prime numbers, so clearly cannot be a prime number as it is product of two prime numbers [from Eq. (ii)]. Sum of two prime numbers is always an even number except in one situation when one prime number is 2. can be a prime number and can be composite number.  Now,  can be prime numbers, can be composite numbers, so is not certain.  So, option (d) is correct. | | | | | | | |
| 251 | **(b)**  Let and | | | | | | | |
| 252 | **(d)**  Given that,  and  min  (upward parabola)  max  (downward parabola)  Now, | | | | | | | |
| 253 | **(b)**  is the only complex number which satisfies the given relations | | | | | | | |
| 254 | **(d)**  Let be the common root of the given equations  Then,  And  and  and | | | | | | | |
| 255 | **(c)**  We have, | | | | | | | |
| 256 | **(b)**  Given, has imaginary roots  Discriminant,  Now,  Also, ...(i)  Since,  Hence, Eq. (i) has imaginary roots | | | | | | | |
| 257 | **(b)**  Let  Hence, the first significant figure is 17 | | | | | | | |
| 258 | **(d)**  Let and  Given,  …(i)  And …(ii)  Now,  [from Eqs. (i) and (ii)] | | | | | | | |
| 259 | **(a)**  Sum of roots  And product of the roots  Given, | | | | | | | |
| 260 | **(b)**  Here, ...(i)  ...(ii)  And ...(iii)  On squaring Eq. (ii), we get  Now, | | | | | | | |
| 261 | **(c)**  Given equation can be rewritten as .  But factors are rational so discriminant is a perfect square.  Now,  Hence, (as it is perfect square).  Now, taking ve sign, we get | | | | | | | |
| 262 | **(d)**  Here, and  But  Also,  Hence, | | | | | | | |
| 263 | **(a)**  Let are the roots of the equation  And are the roots of the equation  Given, | | | | | | | |
| 264 | **(b)**  Multiplying the numerator and denominator by and respectively of I and II expression, we get | | | | | | | |
| 265 | **(c)**  Let  Given expression  Since, imaginary part of given expression is zero, we have  or | | | | | | | |
| 266 | **(a)**  Given,  Locus of is -axis | | | | | | | |
| 267 | **(c)**  We have, | | | | | | | |
| 268 | **(b)**  We have, | | | | | | | |
| 269 | **(c)**  We have,  where  and the origin form an equilateral triangle | | | | | | | |
| 270 | **(c)**  We have,  and  and  are in A.P. | | | | | | | |
| 271 | **(d)**  We have, | | | | | | | |
| 272 | **(b)**  Given, …(i)  Now, | | | | | | | |
| 273 | **(c)**  If are complex numbers, then  [by triangle inequality] | | | | | | | |
| 274 | **(a)**  Since, roots are equal | | | | | | | |
| 275 | **(d)**  We have,  …(i)  Let  …(ii)  Let  [from Eq. (i)]  [from Eq.(ii)]  Required equation is, | | | | | | | |
| 276 | **(b)**  Let Then,  And, | | | | | | | |
| 277 | **(a)**  We have,  Hence, the minimum value of is 1 | | | | | | | |
| 278 | **(b)**  Given,  On adding on both sides in the given equation, we get  This equation will represent a circle, if | | | | | | | |
| 279 | **(a)**  We have,  Therefore, the point having affix is equidistant from the four points having affixes . Thus is the affix of either the centre of a circle or the point of intersection of diagonals of a square (or rectangle). Therefore, are either concyclic or vertices of a square (of rectangle). Hence, are concyclic | | | | | | | |
| 280 | **(a)**  Since, and are the roots of the equation and respectively, then  As given are in GP, therefore  ...(i)  But [from Eq. (i)]  Also, | | | | | | | |
| 281 | **(c)**  Given, ,  Now,  Also,  Now, | | | | | | | |
| 282 | **(a)**  Given equation is  If roots are real then  As roots are less than 3, hence  Hence, only satisfy. | | | | | | | |
| 283 | **(b)** | | | | | | | |
| 284 | **(a)**  We have, | | | | | | | |
| 285 | **(b)**  Here, ...(i)  The quadratic equation whose roots are and , is  [from Eq. (i)]  On comparing with , we get | | | | | | | |
| 286 | **(b)**  We have,  Clearly, and are reciprocal of each other and the given expression does not alter by replacing by So, we will compute its value for one of these two values of  For we have | | | | | | | |
| 287 | **(d)**  Since are roots of  The equation whose roots are is | | | | | | | |
| 288 | **(c)**  Here, and  Now, | | | | | | | |
| 289 | **(b)**  Let be a common root of the equations  and  Then,  and  Now,  Putting, in we get  which is not possible for any  Putting in we get  which is true for all  Thus, the two equations have exactly one common root for all | | | | | | | |
| 290 | **(c)** | | | | | | | |
| 291 | **(b)**  Let the incorrect equation is  Since, roots are -7 and -2  Product of roots,  So, correct equation is | | | | | | | |
| 292 | **(c)**  Let Both the roots of will exceed if  (i) Discriminant  (ii) A lies outside the roots i.e.  (iii) -coordinate of vertex  and  and  and  and | | | | | | | |
| 293 | **(c)**  Since are positive  Hence, the equation has no real roots | | | | | | | |
| 294 | **(b)**  By Rolle’s Theorem, between any two roots of a polynomial there is a root of Therefore, for same | | | | | | | |
| 295 | **(b)**  Given,  Cube roots of are and  Cube roots of are and  Cube roots of are and | | | | | | | |
| 296 | **(b)**  Given equation is  For equal roots, discriminant=0 | | | | | | | |
| 297 | **(c)** | | | | | | | |
| 298 | **(b)**  We have, | | | | | | | |
| 299 | **(a)**  We have,  Let Then,  Hence, and are common roots of the two equations | | | | | | | |
| 300 | **(b)**  As , therefore , where  Let , and | | | | | | | |
| 301 | **(d)**  Since,  and given equation will have no real values of for any , if  (as | | | | | | | |
| 302 | **(a)**  Let  On squaring both sides, we get  Since, does not satisfy the given equation  The required solution is | | | | | | | |
| 303 | **(b)**  Let and be the roots of the given equation, then  Required equation is | | | | | | | |
| 304 | **(a)**  Here,  Shaded part represents the external part of circle having centre (-1, 0) and radius 2  D:\Common Folder\Data Typing Files\Sujata\scan\scan\new.jpg  As we know equation of circle having centre and radius , is  …(i)  Also, argument of with represent to positive direction of -axis is  And argument of in anti-clockwise direction is . | | | | | | | |
| 305 | **(a)**  If and are two imaginary cube roots of unity.  Then,  Now,  And  Therefore, the required equation is | | | | | | | |
| 306 | **(b)**  Let the given expression by .  If , then for real .  If , then which is real and this value of is included in the above range. | | | | | | | |
| 307 | **(a)**  We have,  Clearly, it represents a circle having centre at and radius | | | | | | | |
| 308 | **(a)**  On multiplying first equation by , we get  ….(i)  and another given equation is  ….(ii)  On subtracting Eq. (ii) from Eq. (i), we get  Which is a common root.  On putting this value in Eq. (ii), we get | | | | | | | |
| 309 | **(d)**  Given,  [] | | | | | | | |
| 310 | **(d)**  We have, | | | | | | | |
| 311 | **(d)**  Since the roots of the equation  are in H.P. Therefore, the roots of the reciprocal equation i.e. are in A.P. | | | | | | | |
| 312 | **(d)**  Let  The value of depends on  The value cannot be determined | | | | | | | |
| 313 | **(b)**  Applying we get | | | | | | | |
| 314 | **(c)** | | | | | | | |
| 315 | **(c)**  We know that, if and then lie on a line | | | | | | | |
| 316 | **(b)**  We have, | | | | | | | |
| 317 | **(c)**  Since the function is continuous for all and every continuous function attains every value between its maximum and minimum values. Therefore, takes every value between its minimum and maximum values.  We have,  Thus, assumes all real values greater than | | | | | | | |
| 318 | **(c)**  Given,  lies on the perpendicular bisector of the line joining (1, 0)  And (0, 1) and it is a straight line passing through origin. | | | | | | | |
| 319 | **(b)**  Since,  Let  Hence, the number of real roots of the equation is 2 | | | | | | | |
| 320 | **(b)**  Since, the roots of the given equation are real  Discriminant >0 16+4  Hence, the least value of is | | | | | | | |
| 321 | **(d)**  Since,  Since, the product of roots is zero  Then,  Sum of roots | | | | | | | |
| 322 | **(b)**  Given,  On putting  We get  Now, on comparing the coefficients of and , we get  And | | | | | | | |
| 323 | **(a)**  Let be a real root of  Then, | | | | | | | |
| 324 | **(c)**  Let be the roots of the equation  Then,  and  It is given that | | | | | | | |
| 326 | **(d)**  Let | | | | | | | |
| 327 | **(b)**  Let  (given)] | | | | | | | |
| 328 | **(d)**  Here, , | | | | | | | |
| 329 | **(a)**  Now, | | | | | | | |
| 330 | **(a)**  Let  And  Now, | | | | | | | |
| 331 | **(d)**  Let  Clearly, is a parabola opening upward. It is given that a lies between its roots  and  and    or | | | | | | | |
| 332 | **(b)**  Case I When  Now, for  ...(i)  Case II When  Now, for  ...(ii)    From Eqs. (i) and (ii), | | | | | | | |
| 333 | **(c)**  Since,  Considering the rotation about we get, | | | | | | | |
| 334 | **(a)**  Let  Since, it is purely imaginary, therefore real part must be equal to zero  It represents the equation of circle and its radius  Therefore, locus of in argand diagram is a circle of radius | | | | | | | |
| 335 | **(b)**  The coordinates of the points representing and are and respectively | | | | | | | |
| 336 | **(b)**  We have,  …(i)  Now,  [Using (i)] | | | | | | | |
| 337 | **(a)**  We have,  lies on the circle passing through and Clearly, the circle is symmetric about -axis.  Hence, lies on the circle having its centre of -axis | | | | | | | |
| 338 | **(b)**  We have,  Product of roots | | | | | | | |
| 339 | **(d)**  will satisfy the given equation  Now,  Required equation is | | | | | | | |
| 340 | **(d)**  We have,  Let be the new complex number obtained by rotating in the clockwise sense through , therefore  Therefore required complex number is | | | | | | | |
| 341 | **(c)**  Sum of the roots of is  of the roots  Product of the roots of is  of the roots  Clearly, | | | | | | | |
| 342 | **(b)**  This is a quadratic equation in |  Hence, maximum value of | is | | | | | | | |
| 343 | **(b)**  Here, and  Now, | | | | | | | |
| 344 | **(d)**  Here,  Similarly,  And  required equation is | | | | | | | |
| 345 | **(a)**  Given that, and ...(i)  Since, roots of this equation are and  ...(ii)  From Eqs. (i) and (ii),  If , then | | | | | | | |
| 346 | **(a)**  Given that and distinct and    So, is always non-negative. | | | | | | | |
| 347 | **(b)**  Here, and | | | | | | | |
| 348 | **(b)**  Given,  Now, | | | | | | | |
| 349 | **(a)**  We know that, if  or according as or  Let | | | | | | | |
| 350 | **(c)**  We have,  Let be the roots of the equation Then, | | | | | | | |
| 351 | **(b)**  Since, are the roots of the equation then  and  and | | | | | | | |
| 352 | **(a)**  We have, | | | | | | | |
| 353 | **(b)**  The equation formed by decreasing each root of by 1 is  This is identical to the equation  and  and  and | | | | | | | |
| 354 | **(c)**  which satisfy  Also, where  which satisfy | | | | | | | |
| 355 | **(a)**  We have,  Hence, the roots are rational | | | | | | | |
| 356 | **(a)**  Here,  Now,  And  Required quadratic equation is | | | | | | | |
| 357 | **(b)**  Here,  ...(i)  Now,    On putting this value in Eq. (i), we get | | | | | | | |
| 358 | **(b)**  We have,  …(i)  …(ii)  …(iii)  Let and be the pairs of roots of equations (i),(ii) and (iii) respectively. Then,  …(iv)  …(v)  …(vi)  Now,  and  and,  Thus, we have the following sets of simultaneous linear equations:  Hence, there are two triplets | | | | | | | |
| 359 | **(d)**  Given,  Since, is real, therefore is real, if | | | | | | | |
| 360 | **(b)**  Let the equation (incorrectly written form) be  Since, roots are  So, correct equation is | | | | | | | |
| 361 | **(b)**  Given,  Take  Similarly, for , we get the same result | | | | | | | |
| 362 | **(d)**  We have,  and  and  and  and | | | | | | | |
| 363 | **(d)**  Since, is a commom factor of the expressions and  ...(i)  And ...(ii) | | | | | | | |
| 364 | **(d)** | | | | | | | |
| 365 | **(a)**  LCM of 3, 4, 6 is 12.  Hence, is the greatest number. | | | | | | | |
| 366 | **(d)**  We know, | | | | | | | |
| 367 | **(a)**  Let the roots be then | | | | | | | |
| 368 | **(c)**  of | | | | | | | |
| 369 | **(b)**  Let be such that Re Then, | | | | | | | |
| 370 | **(b)**  Diagonals bisect each other  Given that,  Angle at  So, it form a rectangle | | | | | | | |
| 371 | **(d)**  Given,  or  Now, Discriminant, imaginary  Hence, real roots of the given equation is | | | | | | | |
| 372 | **(a)** | | | | | | | |
| 373 | **(b)**  We have,  Origin is the circumcentre of the triangle with the circum radius 1  Also,  Centroid coincides with the origin  Hence, the circumcenter and centroid coincides  Consequently the triangle is equilateral | | | | | | | |
| 374 | **(b)**  Let  But is real, then | | | | | | | |
| 375 | **(d)**  Since the field of complex numbers is not an ordered field. In other words, the order relation is not defined on the set of all complex numbers | | | | | | | |
| 376 | **(c)**  Now, | | | | | | | |
| 377 | **(d)**  We have,  Hence, | | | | | | | |
| 378 | **(b)**  Let  [ cannot be negative] | | | | | | | |
| 379 | **(d)**  We have,  and  and  Clearly, the largest negative integer belonging to this set is | | | | | | | |
| 380 | **(b)**  Given,  Equating real and imaginary parts, we get  and , hence and | | | | | | | |
| 381 | **(d)**  Given, are the roots of equation  and  Now,  And  Hence, required equation is  (sum of roots)(product of roots)=0 | | | | | | | |
| 382 | **(c)**  Here,  And  Also,  [from Eq. (i)] | | | | | | | |
| 383 | **(a)**  We have,  This equation will have real roots, if | | | | | | | |
| 384 | **(b)**  We have, | | | | | | | |
| 385 | **(c)**  Since, and are the roots of , then  and  And | | | | | | | |
| 386 | **(b)**  Given,  And | | | | | | | |
| 387 | **(d)**  We have, | | | | | | | |
| 388 | **(a)**  We have, | | | | | | | |
| 389 | **(b)**  The given equation is  Let then  And  Required equation is | | | | | | | |
| 390 | **(c)**  Here,  …(i)  or  using Eq.(i)] | | | | | | | |
| 391 | **(a)**  Let Then,  …(i)  and, …(ii)  Solving (i) and (ii), we get  Thus, the solutions are | | | | | | | |
| 392 | **(b)**  We have,  and Min.amp    Now,  and, | | | | | | | |
| 393 | **(b)**  Here,  Also,  Sum of given roots  and product of given roots  Hence, the required equation is given by | | | | | | | |
| 394 | **(b)**  Given,  By using De-Moivre’s theorem, we get | | | | | | | |
| 395 | **(a)**  Let  For making a right angled , point either in IInd quadrant or IVth quadrant  If the point is in IInd quadrant, then we take  Point is and if the point is in IVth quadrant then we take  Point is | | | | | | | |
| 396 | **(b)**  Let  Given, | | | | | | | |
| 397 | **(d)**  Given, and  Required equation is | | | | | | | |
| 398 | **(d)**  Given,  Therefore, the number of non-zero integral solutions is zero | | | | | | | |
| 399 | **(b)**  Here, and | | | | | | | |
| 400 | **(c)**  Let be a common root of and Then,  and | | | | | | | |
| 401 | **(d)**  The vertices of the triangle are | | | | | | | |
| 403 | **(b)**  Let be a parallelogram such that affixes of are respectively. Then,  Conversely, if then  is a parallelogram  Thus, is a necessary and sufficient condition for the figure to be a parallelogram | | | | | | | |
| 404 | **(b)**  We have,  where | | | | | | | |
| 405 | **(a)**  The discriminant of the given equation is given by    Hence, roots of the given equation are imaginary | | | | | | | |
| 406 | **(c)**  We have,  Since and have two common roots. Therefore, and are common roots of the two equations.  Hence, | | | | | | | |
| 407 | **(a)**  Since, roots of the equation  Discriminant,  Hence, are in AP. | | | | | | | |
| 408 | **(c)**  We have,  is a multiple of 4  Hence, the least positive integer satisfying the above condition is 4 | | | | | | | |
| 409 | **(d)**  It is given that are roots of the equation  It is also given that and are the roots of the equation  and  and  and and | | | | | | | |
| 410 | **(c)**  We have, | | | | | | | |
| 411 | **(b)**  Given,  (where )  Hence, it represents a equation of circle | | | | | | | |
| 412 | **(b)**  Given, | | | | | | | |
| 413 | **(c)**  Let and are the roots then  Given, | | | | | | | |
| 414 | **(a)**  Let be the common root for both the equations and , then  And  and  Hence, | | | | | | | |
| 415 | **(b)**  Let be a quadratic expression such that for all Then,  and  Now,  Let be the discriminant of Then,  Thus, we have  and for all | | | | | | | |
| 416 | **(b)**  Given,  On equating real part on both sides, we get | | | | | | | |
| 417 | **(a)** | | | | | | | |
| 418 | **(d)**  Since, and  Also  Now, | | | | | | | |
| 419 | **(a)**  Let be the roots of the equation . | | | | | | | |
| 420 | **(a)**  Since the graph of is strictly above the -axis  for all  for all | | | | | | | |
| 421 | **(a)**  Let  Clearly, represents a parabola opening upward  It is given that 1 lies between the roots of  Discriminant and  and | | | | | | | |
| 422 | **(c)**  Let  Put , | | | | | | | |
| 423 | **(a)**  Since are roots of Therefore, the equation whose roots are and is | | | | | | | |
| 424 | **(a)**  Since, and are in GP    Given, equation becomes  (respected roots)  Since, this root satisfy the second equation  ()  are in GP | | | | | | | |
| 425 | **(b)**  We know that for given the equation  represents a circle, if  Therefore, the equation  will represent a circle, if | | | | | | | |
| 426 | **(d)**  Put , then  or  or  or  Hence, the real roots of the given equation are | | | | | | | |
| 427 | **(b)**  Let be the attitude of Then, is the mid-point of  Now, | | | | | | | |
| 428 | **(d)**  Let  Since,  and | | | | | | | |
| 430 | **(d)**  We know that the expression for all , if and .  is positive for all , if | | | | | | | |
| 431 | **(a)**  Given equation is  Now, roots of are  Roots are | | | | | | | |
| 432 | **(a)** | | | | | | | |
| 433 | **(a)**  Let  put  Taking Ist and IInd terms  …(i)  Taking IInd and IIIrd terms  …(ii)  Taking Ist and IIIrd terms  …(iii)  From Eq. (i),  From Eqs. (i) and (iii),  On putting the value of and in Eq. (ii), we get  One solution exists. | | | | | | | |
| 434 | **(d)**  Let Then,  Thus, the equation having roots and is | | | | | | | |
| 435 | **(a)**  Here,  And  Required equation is  (sum of roots)(products of roots)=0 | | | | | | | |
| 436 | **(b)**  We have, | | | | | | | |
| 437 | **(b)**  Given, ...(i)  Now,  It means roots of given equation are equal  ...(ii)  On comparing Eqs. (i) and (ii), we get | | | | | | | |
| 438 | **(a)**  Given,  Let  Here, the power of are same in Nr and Dr  First we divide the numerator by denominator | | | | | | | |
| 439 | **(c)**  Given, and are the roots of  Now,  And  Required equation is | | | | | | | |
| 440 | **(d)**  The given equation is | | | | | | | |
| 442 | **(b)**  Now, ,  Where  , | | | | | | | |
| 443 | **(d)**  We have,  for all values of | | | | | | | |
| 444 | **(a)**  So, | | | | | | | |
| 445 | **(c)**  We have the following cases:  CASE I  In this cases, we have  CASE II  In this case, we have  Clearly, these values of do not belong to [1, 2]. So, the equation has no solution in [1, 2)  CASE III  Hence, the given equation has two solutions only | | | | | | | |
| 446 | **(c)**  Roots of the equation are  (imaginary roots)  Hence, both roots coincide, so on comparing  So, maximum value does not exist. | | | | | | | |
| 447 | **(a)**  We have,  As , we take only . | | | | | | | |
| 448 | **(c)**  The equation represents an ellipse having foci at and and major axis 3. If is the eccentricity of this ellipse, then  But,  and  and  But, Therefore, | | | | | | | |
| 449 | **(d)**  Let  Now, discriminant  Since, is real and assumes all real values, we must have for all real values of . | | | | | | | |
| 450 | **(b)**  th term of the given series  Thus, sum of the give series | | | | | | | |
| 451 | **(c)**  The cube roots or unity are Let and represent and respectively. Clearly,  and  Thus, points representing form an equilateral triangle.  ALITER Let and Then,  Hence, points representing form an equilateral triangle | | | | | | | |
| 452 | **(a)**  The equation has complex roots which always occur in pairs. So, the two equations have both roots common | | | | | | | |
| 454 | **(d)**  We have,  So, the given equation has four real roots | | | | | | | |
| 455 | **(c)**  We have,  and | | | | | | | |
| 456 | **(b)** | | | | | | | |
| 457 | **(d)**  must divide .  Now,  Reminder must be zero | | | | | | | |
| 458 | **(a)**  Let be the sides of an equilateral and let represent the complex numbers respectively    From the equilateral ,  and  Also, , since triangle is equilateral. Thus, the complex numbers and have same modulus and same argument, which implies that the numbers are equal, that is | | | | | | | |
| 459 | **(c)**  Given equations are comparing with  And respectively, we get  And  Condition for common roots is | | | | | | | |
| 460 | **(c)**  Multiplying by  ...(i)  are the roots of , therefore they will satisfy Eq. (i)  Also, …(ii)  and  Adding Eqs. (ii) and (iii), we get  or  or (Given | | | | | | | |
| 461 | **(d)**  Let be a real root of the given equation.  Then,  where  and  and | | | | | | | |
| 462 | **(a)**  Given,  Taking log on both sides, we get | | | | | | | |
| 463 | **(d)**  Here, ...(i)  [from Eq. (i)]  And  [from Eq. (i)] | | | | | | | |
| 464 | **(a)**  Let  Then,  Since, is real, therefore  Discriminant, | | | | | | | |
| 465 | **(b)**  Let  But the value of the given expression cannot be negative or less than 2, therefore is required answer. | | | | | | | |
| 466 | **(b)**  We have, | | | | | | | |
| 467 | **(b)**  Since are roots of  and …(i)  Now,  are roots of  and  …(ii)  Since are roots of  is even | | | | | | | |
| 468 | **(a)**  Given,  Since, | | | | | | | |
| 469 | **(c)**  Since, be the roots of .  ...(i)  and ...(ii)  Now,  [from Eq. (ii)]  [from Eq. (i)]  Again  Required equation is | | | | | | | |
| 470 | **(d)**  Let the roots be Then,  Now, | | | | | | | |
| 471 | **(c)**  We have, | | | | | | | |
| 472 | **(d)**  Given,  Let and  Now,  As we know that the distance from the centre to every vertices is equal  Now, | | | | | | | |
| 473 | **(a)**  Let  which represents a circle | | | | | | | |
| 474 | **(c)**  Since the equation has no real roots. Therefore, the curve does not intersect with -axis. Consequently, has same sign for all values of It is given that  for all | | | | | | | |
| 475 | **(a)**  (irrational root)  So, other root is  Sum of roots  Product of roots  So, | | | | | | | |
| 476 | **(a)**  Given equation is    Let  If , then  If , then  Hence, is equal to | | | | | | | |
| 477 | **(d)** | | | | | | | |
| 478 | **(c)**  Given,  and  The increasing order is | | | | | | | |
| 479 | **(b)**  We have, | | | | | | | |
| 480 | **(b)**  We have,  Since the roots are equal in magnitude but opposite in sign  Sum of the roots | | | | | | | |
| 481 | **(a)**  Given equation is | | | | | | | |
| 482 | **(c)**  Let be the roots of the given equation. Then,  Clearly, is last when | | | | | | | |
| 483 | **(c)** | | | | | | | |
| 484 | **(b)**  Since roots of the given equation are of opposite signs. Therefore,  Product of roots | | | | | | | |
| 485 | **(c)**  Given,  Let , then  Hence, is real and distinct | | | | | | | |
| 486 | **(a)**  We have,  For we have  Since and are reciprocal of each other and does not change when is replaced by Therefore, the value of remains same for | | | | | | | |
| 487 | **(a)**  We have,  , where is a complex cube root of unity  Let and Then,  The equation whose roots are and is  For other combinations of and we obtain the same equation. Hence, there is only one equation | | | | | | | |
| 488 | **(b)** | | | | | | | |
| 489 | **(c)**  (given) | | | | | | | |
| 490 | **(c)**  Since,  Also, | | | | | | | |
| 491 | **(c)**  Since, is not a multiple of 3, therefore, where is a positive integer.  For ,  Similarly, for | | | | | | | |
| 492 | **(a)**  Let the roots of be and that of be  and  And and  And  Hence, common root is 2 | | | | | | | |
| 493 | **(c)**  Given,  On comparing with  , we get  Radius of circle | | | | | | | |
| 494 | **(a)**  We have,  and  and | | | | | | | |
| 495 | **(b)**  The equation is meaningful for  When we have, | | | | | | | |
| 496 | **(b)**  …(i)  …(ii)  On subtracting Eq.(ii) from Eq. (i), we get | | | | | | | |
| 497 | **(c)**  We have,  Since, it is real therefore Im () should be zero | | | | | | | |
| 498 | **(c)**  We have,  Thus, the given equation has two integral roots | | | | | | | |
| 499 | **(b)**  Area of the triangle on the argand palne formed by the complex numbers is | | | | | | | |
| 500 | **(a)**  [On dividing] ...(i)  Now,  On equating the coefficient of and constant term, we get  And  On solving these equations, we get  Then, from Eq. (i), we get | | | | | | | |
| 501 | **(b)**  Since is a factor of order of the polynomial  where is a polynomial of degree  are all zero for but at  is root of | | | | | | | |
| 502 | **(b)**  Let  and  At least one of and is positive  Hence, the polynomial has at least two real roots | | | | | | | |
| 503 | **(d)**  One of the roots of the given equation is as the sum of the coefficients is zero | | | | | | | |
| 504 | **(d)**  Given,  Now, we have to consider two cases,  Case I When or  Case II When  Hence, the roots are | | | | | | | |
| 505 | **(c)**  Let be an equilateral triangle such that the affixes of the vertices and are and respectively. Let the circumcentre of be at the origin. Then, and  Now, | | | | | | | |
| 506 | **(a)**  Let be the common roots to the equations  and  and  Now, by cross multiplication method, we get  ...(i)  And ...(ii)  From Eqs. (i) and (ii), | | | | | | | |
| 507 | **(d)**  It’s real part is | | | | | | | |
| 508 | **(c)**  Given,  Now, | | | | | | | |
| 509 | **(a)**  Let the roots are so and  Now,  Also, [given]  Or are in AP | | | | | | | |
| 510 | **(d)**  Let roots of the equation are and  and  Now,  And  Required equation is  **Alternate** To find the equation of reciprocal rots, interchange the coefficients of and constant term in the given equation then required equation is | | | | | | | |
| 511 | **(a)**  Let be a root of the equation Then, is a root of  from (i) and (ii), we have  Now, | | | | | | | |
| 512 | **(b)**  We have, | | | | | | | |
| 513 | **(b)**  Since, the roots of the equation  Hence, AM of | | | | | | | |
| 515 | **(c)**  It is given that  Hence, the greatest value of is 6  Since the least value of the modulus of a complex number is zero  is satisfied by  Therefore, the least value of is 0  ALITER Here, we have to find the greatest and least of distances of all points lying inside or the circle from the point It is evident from the Fig. S.3, that the greatest distance is 6 when coincides with and the least distance is 0 when coindies with | | | | | | | |
| 516 | **(d)**  Given,  The locus of is a circle. | | | | | | | |
| 517 | **(b)**  Let be purely real  [as, since ]  and | | | | | | | |
| 518 | **(d)**  Since, is a common factor of the expressions  ...(i)  and ...(ii) | | | | | | | |
| 519 | **(c)**  Since, are roots of unity.  Therefore,  Differentiating both sides w.r.t. we get  Putting on both sides, we get  Now, | | | | | | | |
| 520 | **(c)**  Let be the roots of and be the roots of Then,  and and  It is given that  is an even integer | | | | | | | |
| 521 | **(a)**  Let the rots of the equation be . Also, [given]  ...(i)  Now, since is a root of the equation.  It satisfies the given equation  [from Eq. (i)] | | | | | | | |
| 522 | **(c)**  Here,  But given that  and | | | | | | | |
| 523 | **(a)**  From figure it is clear that, if , then and and if and . In both cases and    and  and [divide by ] | | | | | | | |
| 524 | **(c)**  Since the diagonals of a rhombus bisect each other at right-angle  Also, | | | | | | | |
| 525 | **(a)**  We have, | | | | | | | |
| 526 | **(c)**  Clearly, is not defined for  or,  or, | | | | | | | |
| 527 | **(d)**  Given, , | | | | | | | |
| 528 | **(d)**  Since the equations and have a common root Therefore,  and  Now, | | | | | | | |
| 530 | **(c)**  Given,  Equating real and imaginary parts from both sides, we get | | | | | | | |
| 531 | **(b)**  Given equation can be rewritten as  …(i)  Let roots are , then the product of roots  ….(ii)  and sum of roots,  ...(iii)  On solving Eqs. (ii) and (iii), we get | | | | | | | |
| 532 | **(b)**  We have, | | | | | | | |
| 533 | **(a)**  The given equation is  This equation has roots equal in magnitude but opposite in sign  Sum of the roots | | | | | | | |
| 534 | **(d)**  Since for all  Therefore, has no real roots | | | | | | | |
| 535 | **(d)**  Let  We have, | | | | | | | |
| 536 | **(d)**  Given that,  …(i)  Let (where is real) be a root of Eq. (i), then  …(i)  On equating real and imaginary parts, we get  …(ii)  and  On putting the value of in Eq.(ii), we get | | | | | | | |
| 537 | **(d)**  The given condition suggest that lies between the roots.  Let  For to lie between the roots we must have Discriminant  Now, Discriminant  , which is always true.  Also, | | | | | | | |
| 538 | **(d)**  We have,  and | | | | | | | |
| 539 | **(d)**  Since, and are the roots of equation  Or  Then, and  (given)  Hence, and are the roots of equation | | | | | | | |
| 540 | **(d)**  Here, ...(i)  Now,  [from Eq. (i)] | | | | | | | |
| 541 | **(c)** | | | | | | | |
| 542 | **(c)**  We have, , for real roots discriminant  For  Total seven solutions are possible. | | | | | | | |
| 543 | **(c)**  We have,  and  lies on the circle and also on the perpendicular bisector of the line segment joining and i.e.,  Putting in we get  Hence, the locus of is the single point | | | | | | | |
| 544 | **(a)**  CASE I  In this case, we have  But, and Therefore,  CASE II  In this case, we have  But, and Therefore, | | | | | | | |
| 545 | **(c)**  We have, | | | | | | | |
| 546 | **(a)**  Since, the roots of the equation are in AP which are .  Sum of roots,  Since, is a root, therefore it satisfies the given equation | | | | | | | |
| 547 | **(a)**  The equations and represent two circles having centre and and and a respectively.  These two circles will intersect, if | | | | | | | |
| 548 | **(c)**  Let be the roots of and let be the roots of such that  Hence, the expression does not vary in value | | | | | | | |
| 549 | **(b)**  We have,  Taking log on both sides, we get | | | | | | | |
| 550 | **(d)** | | | | | | | |
| 551 | **(c)**  Using De-Moivre’s Theorem, we have | | | | | | | |
| 552 | **(d)**  We have,  It’s real part | | | | | | | |
| 553 | **(b)**  Let the discriminant of the equation is  and the discriminant of the equation  (from the given relation)  Clearly, at least one of and must be non-negative, consequently at least one of the equation has real roots. | | | | | | | |
| 554 | **(c)**  We know, | | | | | | | |
| 555 | **(a)**  We have, | | | | | | | |
| 556 | **(d)**  Let be the equilateral triangle circumscribing the circle Let be the affixes of vertices and respectively in anti-clock wise sense. Clearly, (origin) is the circumcentre of | | | | | | | |
| 557 | **(d)** | | | | | | | |
| 558 | **(b)**  Let and be the roots, then  and  Now,  Thus, the minimum value of is 5 at | | | | | | | |
| 559 | **(d)**  Let | | | | | | | |
| 560 | **(d)**  Let  Clearly, represents a parabola opening upward.  So, roots of the equation will be less than 2, if  (i) Discriminant  (ii) 2 lies outside the roots i.e.  (iii) -coordinate of vertex  Now,  or, …(i)  (ii) Discriminant  …(ii)  (iii) -coordinate of vertex  From (i),(ii) and (iii), we have  i.e., | | | | | | | |
| 561 | **(d)**  Since, is a complex cube root of unity  Now, | | | | | | | |
| 562 | **(b)**  Let  and | | | | | | | |
| 563 | **(b)**  Let  Since, both roots are less than 5  Then, and  Now,  ...(i)  ...(ii)  And  and ...(iii)  From Eqs. (i), (ii) and (iii), we get | | | | | | | |
| 564 | **(d)** | | | | | | | |
| 565 | **(b)**  Since roots of the equation form a non-decreasing H.P. Therefore, roots of the equation  form a non-increasing A.P.  Let the roots be and where  …(i)  …(ii)  …(iii)  From (i), we have  Putting in (iii), we get  Subtracting the values of and (ii), we get | | | | | | | |
| 566 | **(a)**  Given equation can be reduced to a quadratic equation.  Put  Only 2nd equation has rational roots as and roots are and 2. | | | | | | | |
| 567 | **(b)**  Let Then,  Thus, the curve meets -axis at  If then by hypothesis This means that the curve does not meet -axis  If then by hypothesis, which means that the curve is always below -axis and so it does not intersect with -axis  Thus, in both the cases does not intersect with -axis for any real  Hence, i.e. has imaginary roots and so we have | | | | | | | |
| 568 | **(d)**  Since, are the roots of given equation.  Let  Then,  and  ve  Since, and are of opposite signs therefore by theory of equations there lies a root of the equation between . | | | | | | | |
| 569 | **(c)**  We have,  is a multiple of 4  The smallest positive value of is 2 | | | | | | | |
| 570 | **(d)**  Given, and  and  Now, | | | | | | | |
| 571 | **(a)**  If  And if  Solution set of the equation is | | | | | | | |
| 572 | **(c)**  Let  Given that  …(i)  On differentiating w.r.t. we get  For maximum or minimum, put we get  is maximum for therefore from Eq.(i) | | | | | | | |
| 573 | **(b)**  We have, | | | | | | | |
| 574 | **(c)**    On comparing the coefficients of real and imaginary on both sides, we get  and  , where | | | | | | | |
| 575 | **(b)**  Here,  And  Now, | | | | | | | |
| 576 | **(b)**  We have,  and  Hence, the centroid of is at the origin | | | | | | | |
| 577 | **(c)**  Let  On squaring both sides, we get | | | | | | | |
| 578 | **(c)**  We have, ...(i)  Also, be the roots of .  and  Hence, and are the required roots. | | | | | | | |
| 579 | **(b)**  Let | | | | | | | |
| 580 | **(b)**  It is given that are in G.P.  …(i)  Let be the discriminant of the equation  Then,  Hence, the roots of the given equation are real | | | | | | | |
| 581 | **(a)**  Since, and 5 are the some roots of polynomial of degree . As we know that conjugate are also the roots of the polynomial. Therefore, and are also the roots of the polynomial.  The least value of is 5 | | | | | | | |
| 582 | **(b)**  Given,  On comparing the coefficient of constant term, we get  or | | | | | | | |
| 583 | **(b)**  Given,  Taking modulus from both sides we get | | | | | | | |
| 584 | **(a)**  Given,  The real roots are 1, 2, 3, 4  Hence, only 2 lies in the interval (1, 3) | | | | | | | |
| 585 | **(d)**  is perpendicular bisector of | | | | | | | |
| 586 | **(c)**  Let be the vertices of the triangle having affixes and respectively. Then,  Clearly,  Hence, is isosceles right angled triangle | | | | | | | |
| 587 | **(c)**  Similarly,  And  Now, | | | | | | | |
| 588 | **(a)**  The three cube roots of (i.e. solutions of ) are  Let Then,  If then  Every other choice of will give its value as or | | | | | | | |
| 590 | **(c)**  Since, | | | | | | | |
| 591 | **(b)** | | | | | | | |
| 592 | **(a)**  In a parallelogram the mid point of are the same. But mid point of .  So, that the coordinates of are  Thus, the point corresponds to sum of the complex numbers and | | | | | | | |
| 593 | **(d)**  Let | | | | | | | |
| 594 | **(a)**  We know that,  and  Now,  Hence, minimum value of is 1 | | | | | | | |
| 595 | **(d)**  Given numbers are conjugate to each other,  And  ...(i)  And  ...(ii)  There exists no value of common in Eqs. (i) and (ii) | | | | | | | |
| 596 | **(c)**  Let be a common root of and Then,  and  Putting in either of these two, we get | | | | | | | |
| 597 | **(c)**  Which represents the equation of a circle. | | | | | | | |
| 598 | **(b)**  If , then the equation has all roots positive real, if | | | | | | | |
| 599 | **(b)**  We know that principle argument of a complex number lie between  Therefore, principle  is give by | | | | | | | |
| 600 | **(b)**  The given equation will represent a circle with the line segment joining and as a diameter, if | | | | | | | |
| 602 | **(d)**  Let  Hence, is one of the root of | | | | | | | |
| 603 | **(a)**  Let and 3 are the roots of the equation  And  Again, let and are the roots of the equation  And | | | | | | | |
| 604 | **(b)**  We have,  But,  Clearly, the product of is 1 i.e. a constant. So, their sum i.e. will be least when they are equal i.e.  Least value of  Hence, | | | | | | | |
| 605 | **(b)**  Given equation is .  Let are the roots of the equation.  ….(i)  and ...(ii)  Harmonic mean [from Eq. (ii)] | | | | | | | |
| 606 | **(b)**  We have,  Applying  Hence, two triangle are similar | | | | | | | |
| 607 | **(c)**  It is given that the roots are of opposite signs  Product of roots | | | | | | | |
| 608 | **(b)**  Given,  Which is an equation of circle. | | | | | | | |
| 609 | **(b)**  Let Then,  Now,  lies on the line lying in the first quadrant | | | | | | | |
| 610 | **(c)**  Given,  …(i)  Now,  [using Eq. (i)] | | | | | | | |
| 611 | **(c)**  We have,  where | | | | | | | |
| 612 | **(b)**  Here, and  Now,  So, satisfies the equation | | | | | | | |
| 614 | **(c)** | | | | | | | |
| 615 | **(c)**  LetThen,  The equation has imaginary roots. Thus, the given equation has two real and two imaginary roots | | | | | | | |
| 616 | **(c)**  Let  Here, coefficient of is negative and is positive, therefore it lies in the second quadrant | | | | | | | |
| 617 | **(c)**  Since are roots of    The equation can be written as  Let, be its roots. Then,  Thus, the equation has and as its two roots | | | | | | | |
| 618 | **(b)**  Since,  It will be real, if imaginary part is zero  …(i)  or  on dividing by  Let then ,  Then and  Thus, changes sign from negative to positive in (1, 2)  Let be the root for which and  or  Hence,  where | | | | | | | |
| 619 | **(a)**  We have,  and  and  and | | | | | | | |
| 620 | **(b)**  Now, | | | | | | | |
| 621 | **(b)**  It is given that are roots of | | | | | | | |
| 622 | **(c)**  We have, | | | | | | | |
| 623 | **(d)**  We have, | | | | | | | |
| 624 | **(d)**  CASE I  In this case, we have  which is not true  CASE II  In this case, we have  which is not true for any  Hence, there is no value of satisfying the given inequation | | | | | | | |
| 625 | **(c)**  We have,    and | | | | | | | |
| 626 | **(c)**  For all real  Given equation has no solution | | | | | | | |
| 627 | **(b)**  It is given that are the roots of the equation  and,  Hence, | | | | | | | |
| 628 | **(d)**  Domain of the function is  …(i)  Given equation can be rewritten as  Solution of the given equation are  In the domain (i) the required solutions are . | | | | | | | |
| 629 | **(b)**  Since, is an imaginary cube root of unity. Let it be , then | | | | | | | |
| 630 | **(b)**  Given,  and  Now,  When  When ,  Solutions are | | | | | | | |
| 631 | **(b)**  Locus of is | | | | | | | | |
| 632 | **(b)**  Since, 2 and 3 are the roots of the equation  And  and | | | | | | | |
| 633 | **(d)**  The affix of the centroid of the triangle is  Since the centroid divides the line joining the circumcentre and orthocentre in the ratio Therefore, if is the affix of the orthocentre, then | | | | | | | |
| 634 | **(c)** | | | | | | | |
| 635 | **(d)**  Given, | | | | | | | |
| 636 | **(a)**  We have,  and,  It is evident from these two equations, that and are roots of the equation | | | | | | | |
| 637 | **(b)**  It is given that is purely imaginary. So, let | | | | | | | |
| 638 | **(c)**  are given roots, then  Sum of roots  Product of roots  Required equation is | | | | | | | |
| 639 | **(b)**  It is given that  are roots of  are roots of  and  It is given that form an increasing G.P. Therefore, where  Now,  Thus, and | | | | | | | |
| 640 | **(b)**  We have,  Now,  Product of roots | | | | | | | |
| 641 | **(b)**  We have,  Let be the roots of the equation.  According to the given condition  Also, | | | | | | | |
| 642 | **(d)** | | | | | | | |
| 643 | **(a)**  Since, are in GP, then  …(i)  Given equation is .  Discriminant,  [from Eq. (i)]  Roots are real. | | | | | | | |
| 644 | **(a)**  We have, and let  Let  And  Further, let and be the affixes of points and respectively. Then,  And  is an equilateral triangle.  Thus, | | | | | | | |
| 645 | **(a)** | | | | | | | |
| 646 | **(b)**  We have,  lies on the perpendicular bisector of the segment joining and  lies on -axis | | | | | | | |
| 648 | **(b)**  We know that  for all and for all  Hence, the solution set of the given inequation is | | | | | | | |
| 649 | **(c)**  We have,  which represents a straight line | | | | | | | |
| 650 | **(a)**  Since, are in GP  ...(i)  Also, [given]  Now,  [from Eq. (i)]  Roots of given equation are always real | | | | | | | |
| 651 | **(d)**  Here, and | | | | | | | |
| 652 | **(c)**  From the figure it is clear that amplitude of point | | | | | | | |
| 653 | **(d)**  Let | | | | | | | |
| 654 | **(a)**  The given equation will have real roots iff | | | | | | | |
| 655 | **(c)**  Let and  *and* |  ,  and | | | | | | | |
| 656 | **(c)**  Given,  and | | | | | | | |
| 657 | **(c)**  Let is orthocenter, is centroid and is circumcentre, then | | | | | | | |
| 658 | **(d)**  We have,  This means that the point divides internally in the ratio So, lies on the segment  Hence, distance of from is zero | | | | | | | |
| 659 | **(c)**  Given that, the vertices of quadrilateral are  and  Now,    Sides and diagonals  Hence, it is a square | | | | | | | |
| 660 | **(b)**  Given equation is  Since, roots are real and equal, then  will be in GP. | | | | | | | |
| 661 | **(b)**  Since, [where ] | | | | | | | |
| 662 | **(c)** | | | | | | | |
| 663 | **(d)**  We have, | | | | | | | |
| 664 | **(d)**  Since, ...(i)  And  Now, and are the roots of    []  () | | | | | | | |
| 665 | **(b)**  We have,  Clearly, integers and satisfy this inequality | | | | | | | |
| 666 | **(b)**  According to the equation,  and  Now,  ...(i)    ...(ii)  and ...(iii)  And  and ...(iv)  From Eqs. (i), (ii), (iii) and (iv), we get lie between and 3 | | | | | | | |

|  |  |
| --- | --- |
| 667 | **(c)**  Given equation is |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 668 | **(b)**  Since are roots of To obtain the equation whose roots are we put Putting the given equation reduces to  Thus, the required equation is  or, | | | | | | | |
| 669 | **(d)**  We have, | | | | | | | |
| 670 | **(a)**  Given, | | | | | | | |
| 671 | **(c)**  Given equation is  Since, roots are real, its discriminant,  …..(i)  Now, for all real and for . Therefore, when or . | | | | | | | |
| 672 | **(b)**  Let the two numbers are and  Given, and  and  Hence, required equation is  (sum of roots)product of roots=0 | | | | | | | |
| 673 | **(c)**  and are roots of the equation  or  Taking | | | | | | | |
| 674 | **(a)** | | | | | | | |
| 675 | **(b)**  Conjugate of is | | | | | | | |
| 676 | **(d)**  Here, and  Now,  Hence, it depends on the value of and | | | | | | | |
| 677 | **(a)**  We have,  here cannot be 2.  are positive.  ….(i)  or is negative and is negative.  …(ii)  From Eqs. (i) and (ii), we get | | | | | | | |
| 678 | **(d)**  Let , then it reduces to  and 8 | | | | | | | |
| 679 | **(b)**  We know that only even prime is 2, then  …(i)  and has equal roots.  or [ from Eq. (i)] | | | | | | | |
| 680 | **(b)**  Given,  Let  Which is the equation of a circle. | | | | | | | |
| 681 | **(d)** | | | | | | | |
| 682 | **(a)**  We have, | | | | | | | |
| 684 | **(b)**  The given equation is  Let be its discriminant. Then,  So, roots of the given equation are real | | | | | | | |
| 685 | **(b)**  Sum of roots and product =1  Given, and    ...(i)  And    From Eqs. (i) and (ii), we get  And  Required equation is | | | | | | | |
| 686 | **(b)**  Since, are the roots of the equation  .  and  Now,  Now, the required equation whose roots are and is | | | | | | | |
| 688 | **(b)**  Let therefore given equation becomes  Therefore, given equation represents a circle with radius | | | | | | | |
| 689 | **(a)**  Here,  or where  or | | | | | | | |
| 690 | **(b)**  Now,  Similarly, and | | | | | | | |
| 691 | **(d)**  We have, | | | | | | | |
| 692 | **(b)**  Principle amplitude | | | | | | | |
| 693 | **(a)**  We have,  Therefore  Hence, no solution exist | | | | | | | |
| 694 | **(d)**  We have, | | | | | | | |
| 695 | **(a)**  Given equation of circle is  Here, centre is {-(2+3)} and radius | | | | | | | |
| 696 | **(d)**  We have,  The required equation is | | | | | | | |
| 697 | **(a)**  We have,    Sum of the roots | | | | | | | |
| 698 | **(a)**  Given,  For real | | | | | | | |
| 699 | **(a)**  Here,  And  and  and  and  and | | | | | | | |
| 700 | **(c)**  Given that,  Equating each factor equal to 0, we have  It is clear that. | | | | | | | |
| 701 | **(b)**  Let  Taking log on both sides, we get  (approximately) | | | | | | | |
| 702 | **(b)**  As we know, the equation of the form is a circle, if | | | | | | | |
| 703 | **(a)**  The vertices of the triangle are  or  Required area | | | | | | | |
| 704 | **(b)**  For rational roots must be a perfect square of a rational number and as are natural numbers must be a perfect square of an integer.  are both odd integers or both even integers but is an odd integer. So, and must be even integers. is odd must be odd. Now, let  , odd integer)  odd integer)  is an even integer)  So, contradiction is not a perfect square. So, all cannot be odd integers. | | | | | | | |
| 705 | **(b)**  We have, | | | | | | | |
| 706 | **(d)**  Since, are the roots of the equation  be the roots of . Also  So,  Also, | | | | | | | |
| 707 | **(b)**  We have, | | | | | | | |
| 708 | **(c)**  Since, and are in AP]  is the mid point of the line AC  are collinear  lie on a straight line | | | | | | | |
| 709 | **(c)**  The equation will represent a circle iff | | | | | | | |
| 711 | **(c)**  ...(i)  and  On putting the value of in the Eq. (i), we get | | | | | | | |
| 712 | **(a)**  =  For , we get imaginary part | | | | | | | |
| 713 | **(a)**  Given,  Thus, the locus of is -axis | | | | | | | |
| 714 | **(a)**  The given equations are  …(i)  and …(ii)  Since, root of the Eq. (i) are complex, therefore  Now, discriminant of Eq. (ii) is  Hence, roots are real and unequal. | | | | | | | |
| 715 | **(d)**  Let Then,  Clearly, and  So, there is no value of satisfying the given equation | | | | | | | |
| 716 | **(c)** | | | | | | | |
| 717 | **(b)**  Vertices of the triangle are  and  Area of triangle | | | | | | | |
| 718 | **(d)**  We have,  and | | | | | | | |
| 719 | **(c)**  We have,  Following cases arise:  CASE I  In this case, we have  But, Therefore, i.e.  CASE II  In this case, we have  But, Therefore,  CASE III  In this case, we have  But, So, there is no solution in this case  CASE IV  In this case, we have  and  But, Therefore,  Hence, | | | | | | | |
| 720 | **(d)**  Let be the regular hexagon having its centre at the origin Let be the affix of vertex Then, | | | | | | | |
| 721 | **(c)**  Given that, | | | | | | | |
| 722 | **(c)**  Here,  And | | | | | | | |
| 724 | **(d)**  Given,  Let  For positive sign  For negative sign | | | | | | | |
| 725 | **(a)**  Let roots be and  And | | | | | | | |
| 726 | **(a)**  Here, and  Now, | | | | | | | |
| 727 | **(c)**  Given, | | | | | | | |
| 728 | **(d)**  Since the triangle is equilateral. Therefore,  Again from (i), we have | | | | | | | |
| 729 | **(a)**  [given] | | | | | | | |
| 730 | **(c)**  Given,  [given] | | | | | | | |
| 731 | **(a)**  Since, are the roots of the equation then  and  To eliminate , we get | | | | | | | |
| 732 | **(c)**  Argument of  [Since, the given complex number lies in IIIrd quadrant] | | | | | | | |
| 733 | **(a)**  Let  We have,  Now,  has no real root  for all or, for all  for all | | | | | | | |
| 734 | **(b)**  We have,  Let its roots be Then,  Now, | | | | | | | |
| 735 | **(d)**  Given complex number is  Required conjugate is | | | | | | | |
| 736 | **(a)** | | | | | | | |
| 737 | **(a)**  Clearly,  and,  Thus, the equality holds when each side is equal to 2. But, RHS is equal to 2 for while LHS is less than 2 for this value of Consequently the equation has no solution | | | | | | | |
| 738 | **(c)**  Using partial fractions, we have  Now, | | | | | | | |
| 739 | **(d)**  Given,  (Taking modulus from both side and using ) | | | | | | | |
| 740 | **(b)**  Let  Then,  Since, in argument of a conjugate of a complex, the real axis is unaltered, but imaginary axis be changed, hence it is given by | | | | | | | |
| 742 | **(a)**  We have,  The equation of a line passing through points having affixes and is  So, the equation of the required line is  Clearly, it passes through the origin | | | | | | | |
| 743 | **(d)**  The discriminant of the given equation is given by  Since the equation has real roots. Therefore, | | | | | | | |
| 744 | **(b)**  If the roots of the equation are real, then | | | | | | | |
| 745 | **(d)**  Real part of | | | | | | | |
| 746 | **(b)**  Let | | | | | | | |
| 747 | **(a)**  Let and be the roots of given equation  Then  and  Now,  Given condition, | | | | | | | |
| 748 | **(b)**  We have,  ALITER We have,  Diagonals of a parallelogram with sides and are equal  It is a rectangle | | | | | | | |
| 749 | **(d)**  Since the lines are perpendicular | | | | | | | |
| 750 | **(c)**  Since a quadratic equation with coefficients as odd integers cannot have rational roots. Therefore, the given equation has no rational root | | | | | | | |
| 752 | **(b)**  We have,    It is clear from the figure that it a semi circle | | | | | | | |
| 753 | **(d)**  Since, quadratic equation has three distinct roots. So, it must be identity. So, . | | | | | | | |
| 754 | **(c)**  Since, is the root of given equation so it will satisfy the given equation  On putting the value of in given equation, we get | | | | | | | |
| 755 | **(d)** | | | | | | | |
| 756 | **(c)**  We have, and  Now, | | | | | | | |
| 757 | **(c)**  We have, …(i)  and …(ii)  Let ;  and  Therefore,    from Eqs.(i)and (ii)]  If then  )  ) | | | | | | | |
| 759 | **(b)**  We have,  This means that the roots of the equation are reciprocal of the roots of the equation  Therefore, equations and have same roots | | | | | | | |
| 760 | **(c)**  Given,  Now,  Hence, roots are real | | | | | | | |
| 761 | **(b)**  We have,  moves in such a way that when is rotated through in coincides with  lies on the segment of the circle such that and is above -axis  Now,  Hence, the locus of is | | | | | | | |
| 762 | **(b)**  Here, and | | | | | | | |
| 763 | **(c)**  For the given equation to be meaningful, we must have , the given equation can be written as  Put so that  or  Thus, the given equation has exactly three real solution out of which exactly one is irrational . | | | | | | | |
| 765 | **(a)**  Since,  Since, , the only possible case which gives integral solution, is  …(i)  …(ii)  From Eqs. (i) and (ii), we get  Area of rectangle | | | | | | | |
| 766 | **(b)**  Let  and | | | | | | | |
| 767 | **(d)**  Let  Which is impossible | | | | | | | |
| 768 | **(b)**  Let the required number is .  According to given condition  Since does not hold the condition. | | | | | | | |
| 769 | **(b)**  We have,  is true for all  Hence, the solution set of the given inequation is | | | | | | | |
| 770 | **(d)**  Required product | | | | | | | |
| 771 | **(d)**  We have,  and  Now,  …(i)  Similarly, …(ii)  and …(iii)  On adding Eqs. (i), (ii), (iii), we get  On equating real part on both sides, we get | | | | | | | |
| 772 | **(a)**  Coefficient of in | | | | | | | |
| 773 | **(a)**  Given,  Now, | | | | | | | |
| 774 | **(a)**  Given  This is an equation of circle in diametric form. | | | | | | | |
| 775 | **(b)**  or 2  Hence, makes undefined]  Number of solution is 1 | | | | | | | |
| 776 | **(c)**  Let and, Then,  and, | | | | | | | |
| 777 | **(b)**  We have,  Hence, product of roots as is 0 | | | | | | | |
| 778 | **(a)**  Since,  And,  Here, we assume that and  Now, the given roots of the equation are  and  Sum of roots  And product of roots  Required equation is | | | | | | | |
| 779 | **(c)**  We have,  …(i)  It is given that equation (i) and have two common roots. Also, a quadratic equation has either both real roots or both non-real complex conjugate roots. Therefore, and are the common roots | | | | | | | |
| 780 | **(a)** | | | | | | | |
| 781 | **(c)**  .  Put  and  Number of integer root is 2. | | | | | | | |
| 782 | **(c)**  Since, and are the roots of the equations and respectively.  and  Now, ...(i)  Also,  …(ii)  From Eqs. (i) and (ii) | | | | | | | |
| 783 | **(c)**  Let  Now, | | | | | | | |
| 784 | **(a)**  Let be the root of equation then be a root of second equation, therefore  ….(i)  and  or ...(ii)  On solving Eqs. (i) and (ii), we get | | | | | | | |
| 785 | **(c)**  Given,  Which, represents a straight line. | | | | | | | |
| 786 | **(d)**  Let another root of equation  is | | | | | | | |
| 787 | **(b)**  The given equation is  where  or  or,  Sum of real roots | | | | | | | |
| 788 | **(a)**  Since is a root of the equation  The equation has equal roots | | | | | | | |
| 789 | **(b)**  We have, | | | | | | | |
| 790 | **(a)**  If is divisible by then the remainder must be zero when is divided by  We have,  Remainder  for all  and  and  is a root of | | | | | | | |
| 791 | **(b)**  Since and are roots of the equation  and  Now,  and  And  and  or,  Hence, | | | | | | | |
| 792 | **(a)**  Clearly, for all | | | | | | | |
| 793 | **(a)**  We have,  Clearly, this is meaningful when  Multiplying both sides of (i) by we get  Hence, the given equation has only one real solution | | | | | | | |
| 794 | **(b)**  Since,  And  Now, | | | | | | | |
| 795 | **(a)**  Let roots of given equation are and  ...(i)  ...(ii)  And ...(iii)  These three equations are satisfies by the option (a) | | | | | | | |
| 796 | **(b)**  We have  Hence, greatest and least value of are 6 and 0 respectively | | | | | | | |
| 797 | **(c)**  The given equation is meaningful for  Now,  But, the equation exist for  Hence, the equation has no solution | | | | | | | |
| 798 | **(b)**  We know that the equation represents a circle of radius  Here, | | | | | | | |
| 799 | **(a)**  Hence, the given equation has four solutions | | | | | | | |
| 800 | **(a)**  Let roots of the equation be and  and | | | | | | | |
| 801 | **(a)**  Since, the roots of the equation are in GP. Let the roots be ,. Then, the product of roots is .  So, roots are 1, . | | | | | | | |
| 802 | **(a)**  Given,  For real  From given equation | | | | | | | |
| 803 | **(a)**  Since, are the roots of .  ...(i)  If roots are , then  Sum of roots  [from Eq. (i)]  [from Eq. (i)]  and product of roots  Hence, required equation is given by  (prouduct of roots)=0 | | | | | | | |
| 804 | **(b)**  Real part is | | | | | | | |
| 805 | **(a)** | | | | | | | |
| 806 | **(a)**  Let be the two roots of the equation Then,  and | | | | | | | |
| 807 | **(b)**  Let the roots be and Then,  From (i) and (ii), we get | | | | | | | |
| 808 | **(a)**  Since, and | | | | | | | |
| 809 | **(b)**  We observe that is defined for  Thus, we have,  is a multiple of 4  Hence, the least positive integral value of is 4 | | | | | | | |
| 810 | **(c)**  Here,  And | | | | | | | |
| 811 | **(b)**  Let Then,  Since is maximum. Therefore,  Differentiating we get  is purely imaginary | | | | | | | |
| 812 | **(a)**  Since is a root of order 2 of the polynomial  is a root of | | | | | | | |
| 814 | **(d)**  We have, | | | | | | | |
| 815 | **(c)**  Since, and are in GP.  or  or | | | | | | | |
| 816 | **(d)** | | | | | | | |
| 817 | **(b)**  If is the additive inverse of , the  Here required additive inverse is | | | | | | | |
| 818 | **(d)**  Given equation is  Also, product of its root  [Since, log is not defined for ] | | | | | | | |
| 819 | **(b)**  Let  (given)  Which is an equation of a circle | | | | | | | |
| 820 | **(c)**  Let  The complex number is represented on -axis (imaginary axis) | | | | | | | |
| 821 | **(a)**  It is given that are in G.P.  Now,  [Using ]  Thus, is a common root  Putting we get | | | | | | | |
| 822 | **(d)**  . Then, | | | | | | | |
| 823 | **(b)**  The given equation is  Let  and  Required equation is | | | | | | | |
| 824 | **(d)** | | | | | | | |
| 825 | **(c)**  We have,  or  Since and have two roots in common. Therefore, and are common roots.  Now,  is a root of | | | | | | | |
| 827 | **(c)**  Equations  and have at least one common root, let common root be .  and  (where are the cube roots of unity) | | | | | | | |
| 828 | **(a)**  Let Then,  Hence, lies on the circle  ALITER We have,  lies on the circle having and as the end-points of the diameter | | | | | | | |
| 829 | **(b)**  We have,  Similarly,  Since  Thus, the either case, we have  Thus, the equation having and as its roots is | | | | | | | |
| 830 | **(d)**  Given, | | | | | | | |
| 831 | **(c)**  Given equations are have a common root, if | | | | | | | |
| 832 | **(d)**  Given,  Which represents a circle whose radius is zero. | | | | | | | |
| 833 | **(d)**  The equation has and as its roots. Let and Then,  Hence, and are roots of the same equation | | | | | | | |
| 834 | **(b)**  Given relation is | | | | | | | |
| 835 | **(a)**  Given equation is  So, | | | | | | | |
| 836 | **(a)**  Given,  Here, ,  Here, we see that for all odd values of , we get the value of is 1 | | | | | | | |
| 837 | **(d)**  We have, | | | | | | | |
| 838 | **(a)**  Given, | | | | | | | |
| 839 | **(c)**  We have, | | | | | | | |
| 840 | **(c)**  Here, and  Now,  And  Required equation is  -(sum of roots)products of roots=0 | | | | | | | |
| 841 | **(d)**  and  Which is not possible  Hence, no real root exist | | | | | | | |
| 842 | **(b)**  Here,  So, | | | | | | | |
| 843 | **(a)**  We have,  From (i) and (ii), we get | | | | | | | |
| 844 | **(c)**  Given,  Now,  Hence, both roots are always real | | | | | | | |
| 845 | **(c)**  Here, | | | | | | | |
| 846 | **(a)**  or  Hence,  or | | | | | | | |
| 847 | **(a)**  If is a factor of  , then by putting , we get | | | | | | | |
| 848 | **(c)**  It is given that is divisible by and  and  …(i)  and …(ii)  From (ii), we get  Putting, in (i), we get  or  Thus, or, and  Clearly, is satisfied by  and  and | | | | | | | |
| 849 | **(b)**  Since are in A.P. Therefore,  (common difference), and  We have,  (twice)  Thus, is a common root of the two equations  Since, is a root of  Now,  Clearly,  are in A.P. | | | | | | | |
| 850 | **(c)**  Let and  As and  and  Now,  ….(i)  And  …(ii)  On solving Eqs. (i) and (ii), we get  Either or  When | | | | | | | |
| 851 | **(c)**  We have, | | | | | | | |
| 852 | **(c)**  Given that is a factor of , then let is a constant. Then, equating the coefficients of like powers of on both sides, we get  Hence, | | | | | | | |
| 853 | **(c)**  Since and  and both are real  Let Then,  is real  is real  So, | | | | | | | |
| 854 | **(d)**  (when  Again when | | | | | | | |
| 855 | **(c)**  We have, | | | | | | | |
| 856 | **(b)**  We have,  is least positive value of | | | | | | | |
| 857 | **(d)**  We have, If multiplying each term by, the given equation reduces to which is not possible as considering .  Thus, given equation has no roots. | | | | | | | |
| 858 | **(b)**  We have,  Now,  is divisible by  are roots of | | | | | | | |
| 859 | **(a)**  Let,  At  Hence, for no other real value of is zero | | | | | | | |
| 860 | **(d)**  We have,  Since represents a point in the direction perpendicular to the join of and and is a variable point in this direction. Therefore, is a point on a line through perpendicular to the join of and the point  ALITER represents a line passing thorough and parallel to So, is a line passing through and parallel to | | | | | | | |
| 861 | **(a)**  Let be the points represented by the numbers be the point represented by  \\SERVER\Common Folder\Data Typing Files\Sujata\AIEEE Maths all structures\2. sol I 61  Now, the four points form a parallelogram in the following three orders.  (i) (ii) and (iii)  In case (i), the condition for to form a parallelogram is or  Similarly, in case (ii) and (iii),  or  and  or | | | | | | | |
| 862 | **(c)**  Since are roots of Therefore,  and,  and  or,  Now,    But, Therefore,  Least value of is | | | | | | | |
| 863 | **(a)**  Given,  or  or  [but given] | | | | | | | |
| 864 | **(c)**  We have, | | | | | | | |
| 865 | **(b)**  Since, =1  [put ]  Which shows that lies on a straight line. | | | | | | | |
| 866 | **(d)** | | | | | | | |
| 867 | **(b)**  Let be a root of Then, is a root of  and  Now, | | | | | | | |
| 868 | **(a)**  Given equation can be rewritten as  Discriminant,  Which is, since .  Hence, roots are real and distinct. | | | | | | | |
| 869 | **(c)**  If  Also,  Thus, | | | | | | | |
| 870 | **(b)**  Here, ...(i)  ...(ii)  and ...(iii)  On solving Eq. (ii), we get  Now, | | | | | | | |
| 871 | **(b)**  Let  Magnitude of  And amplitude of | | | | | | | |
| 872 | **(b)**  The discriminant of the given equation is given by  If the given equation has rational roots, then the discriminant should be a perfect square of a rational number, say  is an integer  is an integer  Now,  is an even integer of the form  and are even integers  is an odd integer  Let where Then,  where | | | | | | | |
| 873 | **(d)**  Let and  And  Hence, given complex numbers form an isosceles triangle. | | | | | | | |
| 874 | **(c)**  Let be the triangle such that the affixes of its vertices are and respectively. Then,  Clearly So, the triangle is isosceles | | | | | | | |
| 875 | **(c)**  Let  …(i)  Since are all integers but not all simultaneously equal  If , then and  As, difference of integers=integer  [as minimum difference of two consecutive integers is ()]  Also,  From Eq. (i),  Hence, minimum value of is 1 | | | | | | | |
| 876 | **(d)**  We have,  (say)  On putting we get  We always get 1 and | | | | | | | |
| 877 | **(a)**  The two equations can be written as  Equation (ii) can be written as  Comparing (i) and (iii), we get | | | | | | | |
| 878 | **(b)**  Given, | | | | | | | |
| 880 | **(a)**  Let  and | | | | | | | |
| 881 | **(b)**  We know that, is  , then    lies on -axis (imaginary axis). | | | | | | | |
| 882 | **(d)**  The given equation is  It is given that roots lie between 5 and 10  and  and | | | | | | | |
| 883 | **(a)**  Let  Then,  [ exponential is always positive] | | | | | | | |
| 884 | **(b)**  Given,  [Put ]  Hence, is a purely imaginary. | | | | | | | |
| 886 | **(a)**  We have, | | | | | | | |
| 887 | **(d)**  It is given that are the roots of the equation  Hence, | | | | | | | |
| 888 | **(c)**  Here, ...(i)  And ...(ii)  Now,  [from Eq. (ii)]  [from Eq. (i)]  And  Required equation is | | | | | | | |
| 889 | **(a)**  If | | | | | | | |
| 890 | **(c)**  Given,  Consider the rotation about , we get | | | | | | | |
| 891 | **(c)**  We have,  On multiplying by both sides (if ,  has three solutions and is also a solution  So, total number of solution is 4 | | | | | | | |
| 892 | **(d)**  Let Then,  which is a hyperbola | | | | | | | |
| 893 | **(c)**  Let , then  and  Given,  On comparing real and imaginary part, we get  And  On solving, we get | | | | | | | |
| 894 | **(d)**  Given that, and  Also,  Required equation is | | | | | | | |
| 895 | **(c)**  We have,  and  and or  and | | | | | | | |
| 896 | **(c)**  We have,  is the angle between and | | | | | | | |
| 897 | **(a)**  Let  If the roots of are imaginary, then we cannot say anything about (i.e. it can be positive, negative or zero). So, options (b),(c) and (d) are not necessarily true  Further, if then the graph of is above -axis and hence  for all  Similarly, if then the graph of is below -axis and hence  for all | | | | | | | |
| 898 | **(a)**  Since, are the roots of the equation , therefore  Now,      Also,  The given expression | | | | | | | |
| 899 | **(a)**  We have,  and  and | | | | | | | |
| 900 | **(a)**  Given,  Now, | | | | | | | |
| 901 | **(b)**  Now,  And,  Hence, it is a square. | | | | | | | |
| 902 | **(c)**  The given expression is meaningful for  Hence, the given expression last value of the is | | | | | | | |
| 903 | **(d)**  Given that be a factor of ...(i)  On putting these values in Eq. (i), we get  ...(ii)  and ...(iii)  On solving Eqs.(ii) and (iii), we get | | | | | | | |
| 904 | **(a)**  The RHS of the given equation is greater than or equal to 2 as it is the sum of a positive number and its reciprocal while the LHS is less than or equal to 2. Therefore, the equation holds true only when each side is equal to 2.  LHS is equal to 2 when while RHS is equal to 2 when  Thus, the given equation has no solution | | | | | | | |
| 906 | **(c)**  Let  is real.  ...(i)  Hence, maximum value is 7 and minimum value is . | | | | | | | |
| 907 | **(d)**  Using we can write the given expression as  This is real number, if the values of and is greater than zero | | | | | | | |
| 908 | **(d)**  We have,  Now,  So, the required equation is | | | | | | | |
| 909 | **(c)**  Here,  ...(i)  Since, for all real and for  when | | | | | | | |
| 910 | **(d)**  We have,  and  and  and | | | | | | | |
| 911 | **(b)**  Let the roots be and Then,  Product of roots | | | | | | | |
| 912 | **(a)**  We have,  Sum of the coefficients  Therefore, is a rational root of the given equation.  Let the other rational robe Then,  Product of the roots  Clearly, is rational for all rational values of except | | | | | | | |
| 913 | **(c)**  Let  If has both negative roots, then we must have  (i) Discriminant  (ii) Vertex of is on left side of -axis  (iii)  Now,  (i) Discriminant  …(i)  (ii) Vertex is on left side of -axis  …(ii)  (iii)  or …(iii)  From (i),(ii) and (iii), we obtain  Hence, | | | | | | | |
| 914 | **(b)**  We have,  where  Thus, has its root as | | | | | | | |
| 915 | **(b)**  Given that  Now,  Hence, it has two real roots. | | | | | | | |
| 916 | **(d)**  Let and be the roots of the given equation, then  And | | | | | | | |
| 917 | **(b)** | | | | | | | |
| 918 | **(b)**  Let Then,  It is given that | | | | | | | |
| 919 | **(b)**  We have,  Let the affix of be The affix of the mid point of is  Since the diagonals of a parallelogram bisect each other. Therefore, the affix of the point of intersection of the diagonals is    We have, | | | | | | | |
| 920 | **(a)**  Let | | | | | | | |
| 921 | **(c)**  Let and are the roots of the given equation  Then, and  Also given,  are in AP  are in HP | | | | | | | |
| 922 | **(a)**  Since roots are real. | | | | | | | |
| 923 | **(b)** | | | | | | | |
| 924 | **(b)**  Clearly,  Represents the perpendicular bisector of the segment joining and i.e. -axis  represents the segment of the circle passing through and and lying above -axis such that angle in the segment is  It is evident from the figure that point satisfies both the conditions    Let the affix of be . Then,  Hence, | | | | | | | |
| 925 | **(c)**  It is given that are the roots of the equation  and  Clearly, it is obtained from option (c) by replacing by 2  Now, | | | | | | | |
| 926 | **(a)**  Let are the roots of the given equation. Then,  And  Now, | | | | | | | |
| 927 | **(b)** | | | | | | | |
| 928 | **(b)** | | | | | | | |
| 929 | **(b)**  Now,  …(i)  and  ...(ii)  At [common value from Eqs. (i) and (ii)]  So, | | | | | | | |
| 930 | **(c)**  Given,  Let  And  Now, | | | | | | | |
| 931 | **(c)**  We have,  Affix of the mid point of is same as that of  bisect each other    Thus, is a rectangle and hence a cyclic quadrilateral also | | | | | | | |
| 932 | **(a)**  We have,  and  and  There is no value of satisfying these conditions | | | | | | | |
| 933 | **(a)**  Let  Now,  Here, coefficient of  Thus, LHS of the given equation is always positive whereas the RHS is always less than zero  Hence, the given equation has no solution | | | | | | | |
| 934 | **(c)** | | | | | | | |
| 935 | **(c)**  Given equation is .  Let are the roots of the given equation.  and  Now,    Now, we take the option simultaneously.  It is minimum for . | | | | | | | |
| 936 | **(a)**  Since, is a root of equation . Therefore, will be other root.  Now, Sum of the roots )  Product of roots  Hence, | | | | | | | |
| 937 | **(b)**  Given equation is  Taking log on both sides, we get | | | | | | | |
| 938 | **(d)**  We have | | | | | | | |
| 939 | **(b)**  Let  Then, | | | | | | | |
| 940 | **(d)**  Since, is a right angled isosceles triangle    By rotation about in anti-clockwise sense    On squaring both sides, we get | | | | | | | |
| 941 | **(b)**  Given equation is  Since, roots are equal in magnitude and opposite in sign  Coefficient of is zero  ...(i)  Equation is  ...(ii)  Only option (b) satisfies Eqs. (i) and (ii) | | | | | | | |
| 942 | **(d)**  Given, | | | | | | | |
| 943 | **(d)**  and  and    …(ii)  From Eqs.(i) and(ii)    It is clear from the graph that there is no point of intersection | | | | | | | |
| 944 | **(a)**  We have,  and  and  and  and  But, there is no value of satisfying these two conditions | | | | | | | |
| 945 | **(c)**  Now, | | | | | | | |
| 946 | **(c)**  The function is defined for  or …(i)  Now,  Thus, roots of are  Clearly, a root of the above equation lying in the domain of the definition of is | | | | | | | |
| 947 | **(d)**  Since, and are the roots of  Since,  Now, and | | | | | | | |
| 948 | **(a)**  Given equation can be rewritten as  Let its roots be and . | | | | | | | |
| 949 | **(a)**  Let Then, | | | | | | | |
| 950 | **(c)**  Given,  [on squaring both sides]  Hence, locus of is a straight line parallel to -axis | | | | | | | |
| 951 | **(b)**  We have, | | | | | | | |
| 952 | **(b)**  Let be the roots of a quadratic and be the roots of another quadratic. Since the quadratics remain same.  Now,  or, or,  If then    Thus, we get two sets of values of and viz. and  If then  or  Putting in we get  Putting in we get  Putting in we get  Thus, we get four pairs of values of and  Hence, there are four quadratic equations which remains unchanged by squaring their roots | | | | | | | |
| 953 | **(d)**  Given,  It is perpendicular bisector of line joining and | | | | | | | |
| 954 | **(a)**  Here, | | | | | | | |
| 955 | **(b)**  Given,  And  But [given] | | | | | | | |
| 956 | **(a)**  As and origin form an equilateral triangle,  we have, | | | | | | | |
| 957 | **(a)**  given] | | | | | | | |
| 958 | **(c)**  Since, is a factor of  On equating the coefficients of like powers of we get  and | | | | | | | |
| 959 | **(c)**  We have,  Let Then,  …(i)  Putting in (i), we get  Hence, or, | | | | | | | |
| 960 | **(d)**  Given equation is  Let , then given equation can be written as  But the value of is always positive so we take only  Which is impossible since cannot be greater than 1.  Hence, we cannot find any real value of which satisfies each given equation. | | | | | | | |
| 961 | **(a)**  We have,  Hence, | | | | | | | |
| 962 | **(b)**  Since, is a root of the equation , then the other root will be  And  The value of is | | | | | | | |
| 963 | **(a)**  Equation of circle whose centre is and radius is , is | | | | | | | |
| 964 | **(a)** | | | | | | | |
| 965 | **(c)**  Given, | | | | | | | |
| 966 | **(a)**  Since, are roots of unity  Now, | | | | | | | |
| 967 | **(d)**  Since are roots of and are roots of Therefore,  and  and  Thus, becomes whose roots are | | | | | | | |
| 968 | **(a)**  We have,  and | | | | | | | |
| 969 | **(c)**  ...(i)  ...(ii)  From Eq. (ii)    From Eq. (i) | | | | | | | |
| 970 | **(a)** | | | | | | | |
| 971 | **(a)**  Since, one root of the equation  is , then the other root will be  Since of roots  And product of roots | | | | | | | |
| 972 | **(a)** | | | | | | | |
| 973 | **(c)**  Also,  is the required value. | | | | | | | |
| 974 | **(c)**  We know that  Now,  and  Now, , if and or if and  Thus, the minimum value of . | | | | | | | |
| 975 | **(a)**  Given, | | | | | | | |
| 976 | **(a)**  Let be a negative common root of equations and Then,  and  [On subtraction]      Putting in we get | | | | | | | |
| 977 | **(a)**  We have, | | | | | | | |
| 978 | **(c)**  Let and be the roots of Then,  But, is a root of | | | | | | | |
| 979 | **(c)**  Given,  On equating the coefficient of and constant on both sides, we get  ...(i)  And ...(ii)  On solving Eqs. (i) and (ii), we get | | | | | | | |
| 980 | **(b)**  On equating the real and imaginary parts on both sides, we get | | | | | | | |
| 981 | **(b)**  We have,  Now, | | | | | | | |
| 982 | **(d)**  Let If will have a root of order 2, then and have a common root  We have,  Clearly, is not a root of Therefore, is a common root  Putting in we get | | | | | | | |
| 983 | **(b)**  Given equation is  On putting only satisfies this equation  So, is a root of this equation and from the given options only (b) has this root | | | | | | | |
| 984 | **(a)**  Let  and  where and  Given, |  …(i)  Now,  is purely imaginary  **Alternative** , Assume any two complex number satisfying both conditions, and  Let  It is purely imaginary | | | | | | | |
| 985 | **(b)**  The roots of the equation are given by  (i) Let  Now, if  The roots are negative.  (ii) Let then the roots are given by  (  Which are imaginary and have negative part.  In each case the root have negative real part. | | | | | | | |
| 986 | **(c)**  Since, the value of function at different points are  Hence, one root lie in (.  2 root lie in (0, 1) and last root lie in (1, 2). | | | | | | | |
| 987 | **(d)**  Given,  Which is an equation of straight line. | | | | | | | |
| 988 | **(a)**  The given equation can be rewritten as Its roots  Let  Put and respectively, we have  Therefore, is not a root of the equation  Again,  Therefore, is a root of the equation =0  Similarly,  Hence, and are the common roots | | | | | | | |
| 989 | **(a)**  We know that,  So, greatest and least value of where and are 31 and 9 respectively | | | | | | | |
| 990 | **(b)**  Here, and  Sum of the given roots  And product of the given roots  Required equation is  (sum of roots)product of roots=0 | | | | | | | |
| 991 | **(d)** | | | | | | | |
| 992 | **(d)**  For collinear points | | | | | | | |
| 993 | **(d)**  Discriminant  Roots are real, rational and unequal | | | | | | | |
| 994 | **(a)**  Here,  And  We know that | | | | | | | |
| 995 | **(d)**  We have, | | | | | | | |
| 996 | **(d)**  Let  Then, | | | | | | | |
| 997 | **(c)**  Since, are the roots of .  Then,  Let the roots of then  Now,  Hence, | | | | | | | |
| 998 | **(b)**    By rotating in clockwise sense  …(i)  Also, …(ii)  On dividing Eq.(i) by Eq. (ii), we get | | | | | | | |
| 999 | **(a)**  Let be the common factor of and Then,  Subtracting (ii) from (i), we get  Putting in (i), we get | | | | | | | |
| 1001 | **(c)**  Let and be the orthocenter, centroid and circumcentre respectively, then | | | | | | | |
| 1002 | **(a)**  Let and has non-real roots, will have the same sign for all values of .  Also, | | | | | | | |
| 1003 | **(d)** | | | | | | | |
| 1004 | **(d)**  Let be discriminants of and respectively. Then  [given]  both are positive. | | | | | | | |
| 1005 | **(d)**  Imaginary part is | | | | | | | |
| 1006 | **(b)**  Equating coefficient of different powers of  Given expression | | | | | | | |
| 1007 | **(c)**  If  Then  or  and Re | | | | | | | |
| 1008 | **(d)**  It is given that is a root of Let be the orther root. Then, | | | | | | | |
| 1009 | **(c)**  Let  and  The expression  Which is given as real  Which is a circle with centre (1, 0) and radius 1 | | | | | | | |
| 1010 | **(a)**  Since, | | | | | | | |
| 1011 | **(b)**  Put  is not possible)  Total number of real roots are 2. | | | | | | | |
| 1012 | **(c)**  We have, | | | | | | | |
| 1013 | **(a)**  Clearly, and are on the opposite side of the origin such that Therefore,  and | | | | | | | |
| 1014 | **(d)**  Here,  The required equation is | | | | | | | |
| 1015 | **(a)** | | | | | | | |
| 1016 | **(b)**  We have,  Therefore, the number of non-zero integral solution is one | | | | | | | |
| 1017 | **(d)**  Since,  Hence, smallest positive integer is 4 | | | | | | | |
| 1018 | **(d)**  [on dividing] ...(i)  Now,  On equating the coefficient of and constant, we get  and  and  From Eq. (i), we get  [given]  and  Now, | | | | | | | |
| 1019 | **(a)**  We have, | | | | | | | |
| 1020 | **(d)**  If and are roots of the equation  Then,  Since is a root of  Now,    Now,  Now,  and, | | | | | | | |
| 1021 | **(a)** | | | | | | | |
| 1022 | **(a)**  We have,  or, | | | | | | | |
| 1023 | **(a)**  If one root is , then the other root will be  Given equation is  And | | | | | | | |
| 1024 | **(d)**  Since,  , , all cannot be of same sign.  Roots are real and distinct. | | | | | | | |
| 1025 | **(d)**  We have, for all  So, given equation has no real root | | | | | | | |
| 1026 | **(d)**  Affix of is means that and and are obtained by rotating through and Therefore, affixes of and are and respectively. Hence, the affix of the centroid of triangle is  If are taken in clockwise sense, then the affix of the centroid is    Thus, the affix of the centroid is | | | | | | | |
| 1027 | **(b)**  Let when reflected along will become  When translated by 2 unit  When rotated by angle in anti-clockwise direction will give | | | | | | | |
| 1028 | **(b)**  Since and are roots of the equation  Clearly, are the roots of and  are roots of | | | | | | | |
| 1029 | **(c)**  We have,  has imaginary roots  Thus, the given equation has two real roots | | | | | | | |
| 1030 | **(d)**  Let Then,  Hence, there are infinitely many solution | | | | | | | |
| 1031 | **(d)**  Discriminant of the equation is given by  So, its roots are imaginary and therefore roots are conjugate to each other. Therefore, one common root means both the roots are common.  (say),  Now,  is right angled. | | | | | | | |
| 1032 | **(d)**  We have, | | | | | | | |
| 1033 | **(a)**  We have,  …(i)  Taking conjugate,  …(ii) | | | | | | | |
| 1034 | **(d)**  Given system of equation is  ...(i)  ...(ii)  and ...(iii)  On adding all these equations, we get  …(iv)  On subtracting Eq. (i) from Eq. (iv), Eq. (ii) from Eq. (iv) and Eq. (iii) from Eq. (iv),we get  =2, | | | | | | | |
| 1035 | **(d)**  Given, | | | | | | | |
| 1036 | **(c)**  As, are th roots unity  Putting , we get  times | | | | | | | |
| 1037 | **(d)** | | | | | | | |
| 1038 | **(b)** | | | | | | | |