PREVIOUS YEAR QUESTIONS OF QUADRATIC EQUATIONS

Very Short Answer (1 Mark)

Question 1. Find the roots of the equation $x^2 - 3x - m(m + 3) = 0$, where m is a constant. (2011OD)

Question 2. If 1 is a root of the equations $ay^2 + ay + 3 = 0$ and $y^2 + y + b = 0$, then find the value of ab. (2012D)

Question 3. If $x = -1/2$, is a solution of the quadratic equation $3x^2 + 2kx - 3 = 0$, find the value of k. (2015D)

Question 4. If the quadratic equation $px^2 - 2\sqrt{5}px + 15 = 0$ has two equal roots, then find the value of p. (2015OD)

Short Answer (2 Marks)

Question 5. Find the value of p so that the quadratic equation $px(x - 3) + 9 = 0$ has two equal roots. (2011D, 2014OD)

Question 6. Find the roots of $4x^2 + 3x + 5 = 0$ by the method of completing the squares. (2011D)

Question 7. Find the value of m so that the quadratic equation $mx(x - 7) + 49 = 0$ has two equal roots. (2011OD)

Question 8. Solve for x:
$36x^2 - 12ax + (a^2 - b^2) = 0$ (2011OD)

Question 9. Find the value(s) of k so that the quadratic equation $x^2 - 4kx + k = 0$ has equal roots. (2012D)

Question 10. Find the value of k for which the equation $x^2 + k(2x + k - 1) + 2 = 0$ has real and equal roots. (2017D)

Question 11. Find the value of p for which the roots of the equation $px(x - 2) + 6 = 0$, are equal. (2012OD)

Question 12. Solve the following quadratic equation for x: $4.^{31/2}x_2 + 5x - 2.3^{1/2} = 0$ (2013D)

Question 13. Solve the following for x: $2^{1/2}x^2 + 7x + 5 \cdot 2^{1/2} = 0$ (2017D)

Question 14. Solve the quadratic equation $2x^2 + ax - a^2 = 0$ for x. (2014D)

Question 15. Find the values of p for which the quadratic equation $4x^2 + px + 3 = 0$ has equal roots. (2014OD)

Question 16. Solve the following quadratic equation for x: $4x^2 - 4a^2x + (a^4 - b^4) = 0$. (2015D)

Question 17. Solve the following quadratic equation for x: $9x^2 - 6b^2x - (a^4 - b^4) = 0$ (2015D)

Question 18. Solve the following quadratic equation for x: $4x^2 + 4bx – (a^2 – b^2) = 0$ (20150D)
Question 19. Solve the following quadratic equation for x: $x^2 – 2ax – (4b^2 – a^2) = 0$ (2015OD)

Question 20. If x = 2/3 and x = -3 are roots of the quadratic equation $ax^2 + 7x + b = 0$, find the values of a and b. (2016D)

Question 21. Find the value of p, for which one root of the quadratic equation $px^2 – 14x + 8 = 0$ is 6 times the other. (20170D)

Question 22. If -5 is a root of the quadratic equation $2x^2 + px – 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, find the value of k. (2016OD)

Question 23. Solve for x: $\{2x+9\}^{1/2} + x = 13$. (20160D)

Question 24. Solve for x: $(6x+7)^{1/2} – (2x – 7) = 0$ (20160D)

Short Answer (3 Marks)

Question 25. Find the roots of the following quadratic equation: $2.3^{½}x^2 – 5x + 3^{½} = 0$ (2011D)

Question 26. Solve for x: $4x^2 – 4ax + (a^2 – b^2) = 0$ (2011OD)

Question 27. Solve for x: $3x^2 – 2.6^{½}x + 2 = 0$ (2012D)

Question 28. Find the value(s) of k so that the quadratic equation $2x^2 + kx + 3 = 0$ has equal roots. (2012D)

Question 29. Find the value(s) of k so that the quadratic equation $3x^2 – 2kx + 12 = 0$ has equal roots. (2012D)

Question 30. Solve the following quadratic equation for x: $x^2 – 4ax – b^2 + 4a^2 = 0$ (2012OD)

Question 31. Find the value of k for which the roots of the equation $kx(3x – 4) + 4 = 0$, are equal. (20120D)

Question 32. Find the value of m for which the roots of the equation. $mx(6x + 10) + 25 = 0$, are equal. (2012OD)

Question 33. For what value of k, the roots of the quadratic equation $kx(x – 2.5^{½}) + 10 = 0$, are equal? (2013D)

Question 34. For what values of k, the roots of the quadratic equation $(k + 4)x^2 + (k + 1)x + 1 = 0$ are equal? (2013D)

Question 35. For what value of k, are the roots of the quadratic equation: $(k – 12)x^2 + 2(k – 12)x + 2 = 0$ equal? (2013OD)

Question 36. For what value of k, are the roots of the quadratic equation $y^2 + k^2 = 2(k + 1)y$ equal? (2013OD)

Question 37. Find that non-zero value of k, for which the quadratic equation $kx^2 + 1 – 2(k –$

1)$x + x^2 = 0$ has equal roots. Hence find the roots of the equation. (2015D)
Question 38. Find that value of p for which the quadratic equation $(p + 1)x^2 – 6(p + 1)x + 3 (p + 9) = 0$, $p \neq -1$ had equal roots. (2015D(

Question 39. Solve for x: $\{3\}^{1/2}\ x^2 – 2\ \{23\}^{1/2}\ x – 2\ \{3\}^{1/2} = 0$ (2015OD)

Question 40. Solve for x: $2x^2 + 6\{3\}^{1/2}\ x – 60 = 0$ (2015OD)

Question 41. If the roots of the quadratic equation $(a – b)x^2 + (b – c)x + (c – a) = 0$ are equal, prove that $2a = b + c$. (2016OD)

Question 42. Solve the equation $(4/x)-3= 5 / (2 x+3)$; for x. (2014D)

Question 43. Solve the equation $\{3\}/\{x+1\}-\{1\}/\{2\}=\{2\}/\{3 x-1\}$; $x \neq -1$, $x \neq \{1\}/\{3\}$ for x. (2014D)

Question 44. Solve the equation $\{14\}/\{x+3\}-1=\{5\}/\{x+1\}$; $x \neq -3, -1$, for x. (2014D)

Question 45. Solve for x: $\{2 x\}/\{x-3\}+\{1\}/\{2 x+3\}+\{3 x+9\}/\{(x-3)(2 x+3)\} = 0$, $x \neq 3, -3/2$

Question 46. Solve for x: $\{x+1\}/\{x-1\}+\{x-2\}/\{x+2\}=4-\{2 x+3\}/\{x-2\}$; $x \neq 1, -2, 2$ (2016D)

Question 47. Solve the following quadratic equation for x: x^{2}+[{a}/{a+b}+{a+b}/{a}]x+1=0 (2016D)

Question 48. Solve for x: $\{1\}/\{(x-1)(x-2)\}+\{1\}\{(x-2)(x-3)\}=\{2\}/\{3\}$, $x \neq 1, 2, 3$ (2016OD)

Question 49. Three consecutive natural numbers are such that the square of the middle number exceeds the difference of the squares of the other two by 60. Find the numbers. (2016OD)

Question 50. If the sum of two natural numbers is 8 and their product is 15, find the numbers. (2012OD)

Questions Long Answer (4 Marks)

Question 51. Find the values of k for which the quadratic equation $(3k + 1)x^2 + 2(k + 1)x + 1 = 0$ has equal roots. Also find the roots. (2014D)

Question 52. Find the value of p for which the quadratic equation $(2p + 1)x^2 – (7p + 2)x + (7p – 3) = 0$ has equal roots. Also find these roots. (2014D)

Question 53. Find the roots of the equation $\{1\}/\{x+4\}-\{1\}/\{x-7\}=\{11\}/\{30\}$, $x \neq -4, 7$ (2011D)

Question 54. Find the roots of the equation: $\{1\}/\{2 x-3\}+\{1\}/\{x-5\}=1$, $x \neq \frac{3}{2}, 5$. (2011OD)

Question 55. Solve for x: **$\{1\}/\{x-3\}+\{2\}/\{x-2\}= \{8\}/\{x\}$;** $x \neq 0, 2, 3$ (2013OD)

Question 56. Solve for x: $\{4\}/\{x\}-3= \{5\}/\{2 x+3\}$; $x \neq 0, -\{3\}/\{2\}$ (2013OD)

Solution:

Question 57. Solve for x: {x-2}/{x-3}+ {x-4}/{x-5}= {10}/{3}; x ≠ 3, 5 (2014OD)

Question 58. Solve for x: {3}/{x+1}+ {4}/{x-1}= {29}/{4 x-1} (2015D)

Question 59. Solve for x: {2}/{x+1}+{3}/{2(x-2)}= {23}/{5 x} (2015D)

Question 60. Find x in terms of a, b and c: {a}/{x-a}+ {b}/{x-b}= {2 c}/{x-c}, x ≠ a, b, c (2016D)

Question 61.

Solve the following for x: $\frac{1}{2a+b+2x}=\frac{1}{2a}+\frac{1}{b}+\frac{1}{2x}$ (2013D)

Question 62. A shopkeeper buys some books for 80. If he had bought 4 more books for the same amount, each book would have cost ₹1 less. Find the number of books he bought. (2012D)

Question 63. Sum of the areas of two squares is 400 cm^2. If the difference of their perimeters is 16 cm, find the sides of the two squares. (2013D)

Question 64. The diagonal of a rectangular field is 16 metres more than the shorter side. If the longer side is 14 metres more than the shorter side, then find the lengths of the sides of the field. (2015OD)

Question 65. The sum of three numbers in A.P. is 12 and sum of their cubes is 288. Find the numbers. (2016D)

Question 66. The perimeter of a right triangle is 60 cm. Its hypotenuse is 25 cm. Find the area of the triangle. (2016D)

Question 67. The sum of two numbers is 9 and the sum of their reciprocals is {1}/{2}. Find the numbers. (2012D)

Question 68. The numerator of a fraction is 3 less than its denominator. If 1 is added to the denominator, the fraction is decreased by \frac{1}{15}. Find the fraction. (20120D)

Question 69. The difference of two natural numbers is 5 and the difference of their reciprocals is {1}/{10}. Find the numbers. (2014D)

Question 70. The difference of two natural numbers is 5 and the difference of their reciprocals is {5}/{14}. Find the numbers. (2014D)

Question 71. The numerator of a fraction is 3 less than its denominator. If 2 is added to both the numerator and the denominator, then the sum of the new fraction and original fraction is a {29}/{20}. Find the original fraction. (2015D)

Question 72. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the rectangular park and of altitude 12 m. Find the length and breadth of the rectangular park. (2016OD)

Question 73. A train travels 180 km at a uniform speed. If the speed had been 9 km/hour

more, it would have taken 1 hour less for the same journey. Find the speed of the train. (2011OD)

Question 74. In a flight of 2800 km, an aircraft was slowed down due to bad weather. Its average speed is reduced by 100 km/h and time increased by 30 minutes. Find the original duration of the flight. (2012OD)

Question 75. While boarding an aeroplane, a passenger got hurt. The pilot, showing promptness and concern, made arrangements to hospitalise the injured and so the plane started late by 30 minutes. To reach the destination, 1500 km away in time, the pilot increased the speed by 100 km/hour. Find the original speed/hour of the plane. (2013OD)

Question 76. A train travels at a certain average speed for a distance of 54 km and then travels a distance of 63 km at an average speed of 6 km/h more than the first speed. If it takes 3 hours to complete the total journey, what is its first speed? (2015OD)

Question 77. A bus travels at a certain average speed for a distance of 75 km and then travels a distance of 90 km at an average speed of 10 km/h more than the first speed. If it takes 3 hours to complete the total journey, find its first speed. (2015OD)

Question 78. A truck covers a distance of 150 km at a certain average speed and then covers another 200 km at an average speed which is 20 km per hour more than the first speed. If the truck covers the total distance in 5 hours, find the first speed of the truck. (2015OD)

Question 79. Two pipes running together can fill a tank in 40/13 minutes. If one pipe takes 5 minutes more than the other to fill the tank separately, find the time in which each pipe would fill the tank separately. (2016OD)

Question 80. A motor boat whose speed is 20 km/h in still water, takes 1 hour more to go 48 km upstream than to return downstream to the same spot. Find the speed of the stream. (2011D)

Question 81. A motorboat whose speed in still water is 18 km/h, takes 1 hour more to go 24 km upstream than to return downstream to the same spot.
Find the speed of the stream. (2014OD)

Question 82. The time taken by a person to cover 150 km was 2 hours more than the time taken in the return journey. If he returned at a speed of 10 km/hour more than the speed while going, find the speed per hour in each direction. (2016D)

Question 83. To fill a swimming pool two pipes are to be used. If the pipe of larger diameter is used for 4 hours and the pipe of smaller diameter for 9 hours, only half the pool can be filled. Find, how long it would take for each pipe to fill the pool separately, if the pipe of smaller diameter takes 10 hours more than the pipe of larger diameter to fill the pool. (2015D)