Exam Paper

Standard: 10th **Subject: Mathematics**

Instructions

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Q1. Choose the correct answer from the given four options: **1 Mark**

In the first term of an AP is -5 and the common difference is 2, then the sum of the first 6 terms is:

A 0 **B** 5 **C** 6 **D** 15

Q2. Choose the correct answer from the given four options in the following questions: **1 Mark**

Which of the following equations has the sum of its roots as 3?

A $2x^2 - 3x + 6 = 0.$ **B** $-x^2 + 3x - 3 = 0.$

C $\sqrt{2}x^2 - \frac{3}{\sqrt{2}}x + 1 = 0.$ **D** $3x^2 - 3x + 3 = 0$

Q3. Choose the correct answer from the given four options: **1 Mark**

For what value of k, do the equations 3x - y + 8 = 0 and 6x - ky = -16 represent coincident lines?

A $\frac{1}{2}$ **B** $-\frac{1}{2}$ **C** 2 **D** -2

Q4. Choose the correct answer from the given four options: **1 Mark**

If the common difference of an AP is 5, then what is $a_{18} - a_{13}$?

A 5 **B** 20 **C** 25 **D** 30

Q5. Choose the correct answer from the given four options: **1 Mark**

The value of c for which the pair of equations cx - y = 2 and 6x - 2y = 3 will have infinitely many solutions is:

A 3. **B** -3. **C** -12. **D** No value.

Q6. Choose the correct answer from the given four options: **1 Mark**

The pair of equations x = a and y = b graphically represents lines which are:

A Parallel. **B** Intersecting at (b, a). **C** Coincident. **D** Intersecting at (a, b).

Q7. Choose the correct answer from the given four options in the following questions: **1 Mark**

If two positive integers a and b are written as $a = x^3y^2$ and $b = xy^3$; x, y are prime numbers, then HCF (a, b) is:

A xy. **B** xy^2. **C** x^3y^3. **D** x^2y^2.

Q8. Choose the correct answer from the given four options in the following questions: **1 Mark**

The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is:

A 10. **B** 100. **C** 504. **D** 2520.

Q9. Choose the correct answer from the given four options in the following questions: **1 Mark**

For some integer m, every even integer is of the form:

A m. **B** m + 1. **C** 2m. **D** 2m + 1.

Q10. Choose the correct answer from the given four options in the following questions: **1 Mark**

If $\frac{1}{2}$ is a root of the equation $x^2 + kx - \frac{5}{4} = 0$, then the value of k is.

A 2 **B** -2 **C** $\frac{1}{4}$ **D** $\frac{1}{2}$

Q11. Choose the correct answer from the given four options: **1 Mark**

Graphically, the pair of equations

6x – 3y + 10 = 0

2x – y + 9 = 0

represents two lines which are:

A Intersecting at exactly one point. **B** Intersecting at exactly two points.

C Coincident. **D** Parallel.

Q12. Choose the correct answer from the given four options: **1 Mark**
The 4th term from the end of the AP: –11, –8, –5, ..., 49 is:

A 37 **B** 40 **C** 43 **D** 58

Q13. Choose the correct answer from the given four options in the following questions: **1 Mark**
Which of the following is a quadratic equation?

A $x^2 + 2x + 1 = (4 - x)^2 + 3.$ **B** $-2x^2 = (5 - x)\left(2x - \frac{2}{5}\right).$

C $(k + 1)x^2 + \frac{3}{2}x = 7,$ where $k = -1.$ **D** $x^3 - x^2 = (x - 1)^3.$

Q14. Choose the correct answer from the given four options in the following questions: **1 Mark**
The zeroes of the quadratic polynomial $x^2 + kx + k,\ k \neq 0,$:

A Cannot both be positive. **B** Cannot both be negative
C Are always unequal. **D** Are always equal.

Q15. Choose the correct answer from the given four options: **1 Mark**
The pair of equations x + 2y + 5 = 0 and –3x – 6y + 1 = 0 have:

A A unique solution. **B** Exactly two solutions.
C Infinitely many solutions. **D** No solution.

Q16. Choose the correct answer from the given four options in the following questions: **1 Mark**
The number of polynomials having zeroes as -2 and 5 is:

A 1. **B** 2. **C** 3. **D** More than 3.

Q17. Choose the correct answer from the given four options: **1 Mark**
One equation of a pair of dependent linear equations is -5x + 7y = 2. The second equation can be:

A 10x + 14y + 4 = 0. **B** -10x - 14y + 4 = 0.
C -10x + 14y + 4 = 0. **D** 10x - 14y + 4 = 0.

Q18. Choose the correct answer from the given four options in the following questions: **1 Mark**
If one of the zeroes of the cubic polynomial $x^3 + ax^2 + bx + c$ is –1, then the product of the other two zeroes is:

A b – a + 1. **B** b – a – 1. **C** a – b + 1. **D** a – b – 1.

Q19. Choose the correct answer from the given four options: **1 Mark**
If x = a, y = b is the solution of the equations x - y = 2 and x + y = 4, then the values of a and b are, respectively:

A 3 and 5. **B** 5 and 3. **C** 3 and 1. **D** -1 and -3.

Q20. Choose the correct answer from the given four options in the following questions: **1 Mark**
Given that one of the zeroes of the cubic polynomial $ax^3 + bx^2 + cx + d$ is zero, the product of the other two zeroes is:

A $-\frac{c}{a}$ **B** $\frac{c}{a}$
C 0 **D** $-\frac{b}{a}$

Q21. Choose the correct answer from the given four options: **1 Mark**
The pair of equations y = 0 and y = –7 has:

A One solution. **B** Two solutions.
C Infinitely many solutions. **D** No solution.

Q22. If the HCF of 65 and 117 is expressible in the form 65m – 117, then the value of m is: **1 Mark**

A 4. **B** 2. **C** 1. **D** 3.

Q23. Choose the correct answer from the given four options in the following questions: **1 Mark**
Which constant must be added and subtracted to solve the quadratic equation $9x^2 + \frac{3}{4}x - \sqrt{2} = 0$ by the method of completing the square?

A $\frac{1}{8}$ **B** $\frac{1}{64}$ **C** $\frac{1}{4}$ **D** $\frac{9}{64}$

Q24. Choose the correct answer from the given four options in the following questions: **1 Mark**

$(x^2 + 1)^2 - x^2 = 0$ has:

A Four real roots. **B** Two real roots. **C** No real roots. **D** One real root.

Q25. Choose the correct answer from the given four options in the following questions: **1 Mark**

For some integer q, every odd integer is of the form:

A q. **B** q + 1. **C** 2q. **D** 2q + 1.

Q26. Choose the correct answer from the given four options in the following questions: **1 Mark**

If one of the zeroes of the quadratic polynomial $(k - 1) x^2 + kx + 1$ is -3, then the value of k is:

A $\frac{4}{3}$ **B** $\frac{-4}{3}$ **C** $\frac{2}{3}$ **D** $\frac{-2}{3}$

Q27. Choose the correct answer from the given four options: **1 Mark**

Aruna has only Rs. 1 and Rs. 2 coins with her. If the total number of coins that she has is 50 and the amount of money with her is Rs. 75, then the number of Rs. 1 and Rs. 2 coins are, respectively:

A 35 and 15. **B** 35 and 20. **C** 15 and 35. **D** 25 and 25.

Q28. Choose the correct answer from the given four options in the following questions: **1 Mark**

The quadratic equation $2x^2 - \sqrt{5}x + 1 = 0$ has.

A Two distinct real roots. **B** Two equal real roots.
C No real roots. **D** More than 2 real roots.

Q29. Choose the correct answer from the given four options: **1 Mark**

A pair of linear equations which has a unique solution x = 2, y = -3 is:

A x + y = -1, 2x - 3y = -5. **B** 2x + 5y = -11, 4x + 10y = -22.
C 2x - y = 1, 3x + 2y = 0. **D** x - 4y -14 = 0, 5x - y - 13 = 0.

Q30. Choose the correct answer from the given four options: **1 Mark**

The sum of first 16 terms of the AP 10, 6, 2, ... is:

A -320 **B** 320 **C** -325 **D** -400

Q31. Choose the correct answer from the given four options: **1 Mark**

The famous mathematician associated with finding the sum of the first 100 natural numbers is:

A Pythagoras. **B** Newton. **C** Gauss. **D** Euclid.

Q32. Choose the correct answer from the given four options: **1 Mark**

In an AP, if a = 3.5, d = 0, n = 101, then a_n will be:

A 0 **B** 3.5 **C** 103.5 **D** 104.5

Q33. Choose the correct answer from the given four options in the following questions: **1 Mark**

The largest number which divides 70 and 125, leaving remainders 5 and 8, respectively, is:

A 13. **B** 65. **C** 875. **D** 1750.

Q34. Choose the correct answer from the given four options in the following questions: **1 Mark**

Which of the following is not a quadratic equation?

1. $2(x - 1)^2 = 4x^2 - 2x + 1$.
2. $2x - x^2 = x^2 + 5$.
3. $\left(\sqrt{2}x + \sqrt{3}\right)^2 = 3x^2 - 5x$.
4. $(x^2 + 2x)^2 = x^4 + 3 + 4x^3$.

Q35. Choose the correct answer from the given four options in the following questions: **1 Mark**

If two positive integers p and q can be expressed as $p = ab^2$ and $q = a^3b$; a, b being prime numbers, then LCM (p, q) is:

A ab. **B** a^2b^2. **C** a^3b^2. **D** a^3b^3.

Q36. Choose the correct answer from the given four options: **1 Mark**

If a pair of linear equations is consistent, then the lines will be:

A Parallel. **B** Always coincident.
C Intersecting or coincident. **D** Always intersecting.

Q37. Choose the correct answer from the given four options in the following questions: **1 Mark**

If the zeroes of the quadratic polynomial $ax^2 + bx + c$, $c \neq 0$ are equal, then:

A c and a have opposite signs. **B** c and b have opposite signs.

C c and a have the same sign. **D** c and b have the same sign.

Q38. Choose the correct answer from the given four options in the following questions: **1 Mark**

If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and -3, then:

A a = -7, b = -1. **B** a = 5, b = -1. **C** a = 2, b = -1. **D** a = 0, b = -6.

Q39. Choose the correct answer from the given four options in the following questions: **1 Mark**

Which of the following equations has two distinct real roots?

A $2x^2 - 3\sqrt{2}x + \frac{9}{2} = 0$ **B** $x^2 + x - 5 = 0$

C $x^2 + 3x + 2\sqrt{2} = 0$ **D** $5x^2 - 3x + 1 = 0.$

Q40. Choose the correct answer from the given four options: **1 Mark**

In an AP if a = 1, a_n = 20 and S_n = 399, then n is:

A 19 **B** 21 **C** 38 **D** 42

Q41. Choose the correct answer from the given four options in the following questions: **1 Mark**

The zeroes of the quadratic polynomial $x^2 + 99x + 127$ are:

A Both positive. **B** Both negative

C One positive and one negative. **D** Both equal.

Q42. Choose the correct answer from the given four options: **1 Mark**

The list of numbers – 10, – 6, – 2, 2,... is:

A An AP with d = -16 **B** An AP with d = 4 **C** An AP with d = -4 **D** Not an AP

Q43. Choose the correct answer from the given four options: **1 Mark**

If the 2nd term of an AP is 13 and the 5th term is 25, what is its 7th term?

A 30 **B** 33 **C** 37 **D** 38

Q44. Choose the correct answer from the given four options: **1 Mark**

If the lines given by 3x + 2ky = 2 and 2x + 5y + 1 = 0 are parallel, then the value of k is:

A $\frac{-5}{4}$ **B** $\frac{2}{5}$ **C** $\frac{15}{4}$ **D** $\frac{3}{2}$

Q45. Choose the correct answer from the given four options in the following questions: **1 Mark**

$n^2 - 1$ is divisible by 8, if n is:

A An integer. **B** A natural number. **C** An odd integer. **D** An even integer.

Q46. Choose the correct answer from the given four options in the following questions: **1 Mark**

Which of the following is not the graph of a quadratic polynomial?

A  **B**  **C**  **D** 

Q47. Choose the correct answer from the given four options in the following questions: **1 Mark**

A quadratic polynomial, whose zeroes are –3 and 4, is:

A $x^2 - x + 12.$ **B** $x^2 + x + 12.$

C $\frac{x^2}{2} - \frac{x}{2} - 6$ **D** $2x^2 + 2x - 24.$

Q48. Choose the correct answer from the given four options in the following questions: **1 Mark**

Values of k for which the quadratic equation $2x^2 - kx + k = 0$ has equal roots is:

A 0 only. **B** 4. **C** 8 only. **D** 0, 8.

Q49. Choose the correct answer from the given four options: **1 Mark**

The first four terms of an AP, whose first term is -2 and common difference is -2, are:

A -2, 0, 2, 4 **B** -2, 4, – 8, 16 **C** -2, – 4, – 6, – 8 **D** -2, – 4, – 8, –16

Q50. Choose the correct answer from the given four options in the following questions **1 Mark**

Which of the following equations has no real roots?

A $x^2 - 4x + 3\sqrt{2} = 0$ **B** $x^2 + 4x - 3\sqrt{2} = 0$

C $x^2 - 4x - 3\sqrt{2} = 0$ **D** $3x^2 + 4\sqrt{3}x + 4 = 0$

Q51. Choose the correct answer from the given four options: **1 Mark**

Two APs have the same common difference. The first term of one of these is –1 and that of the other is – 8. Then the difference between their 4^{th} terms is:

A -1. **B** -8 **C** 7 **D** -9

Q52. Choose the correct answer from the given four options in the following questions: **1 Mark**

Which of the following is not a quadratic equation?

A x^2 - 4x + 5 = 0. **B** x^2 + 3x - 12 = 0.

C $2x^2$ - 7x + 6 = 0. **D** $3x^2$ - 6x - 2 = 0.

Q53. Choose the correct answer from the given four options in the following questions: **1 Mark**

The decimal expansion of the rational number $\frac{14587}{1250}$ will terminate after:

A One decimal place. **B** Two decimal places. **C** Three decimal places. **D** Four decimal places.

Q54. Choose the correct answer from the given four options: **1 Mark**

Which term of the AP: 21, 42, 63, 84,..... is 210?

A 9^{th} **B** 10^{th} **C** 11^{th} **D** 12^{th}

Q55. Choose the correct answer from the given four options: **1 Mark**

What is the common difference of an AP in which $a_{18} - a_{14} = 32$?

A 8 **B** -8 **C** -4 **D** 4

Q56. Choose the correct answer from the given four options in the following questions: **1 Mark**

If one of the zeroes of a quadratic polynomial of the form x^2+ax + b is the negative of the other, then it:

A Has no linear term and the constant term is negative. **B** Has no linear term and the constant term is positive.

C Can have a linear term but the constant term is negative. **D** Can have a linear term but the constant term is positive.

Q57. Choose the correct answer from the given four options: **1 Mark**

If 7 times the 7^{th} term of an AP is equal to 11 times its 11^{th} term, then its 18^{th} term will be:

A 7 **B** 11 **C** 18 **D** 0

Q58. Choose the correct answer from the given four options in the following questions: **1 Mark**

The product of a non-zero rational and an irrational number is:

A Always irrational. **B** Always rational. **C** Rational or irrational. **D** One.

Q59. Choose the correct answer from the given four options: **1 Mark**

The father's age is six times his son's age. Four years hence, the age of the father will be four times his son's age. The present ages, in years, of the son and the father are, respectively:

A 4 and 24. **B** 5 and 30. **C** 6 and 36. **D** 3 and 24.

Q60. Choose the correct answer from the given four options: **1 Mark**

The sum of first five multiples of 3 is:

A 45 **B** 55 **C** 65 **D** 75

Q61. Justify whether it is true to say that the following are the nth terms of an AP: $3n^2 + 5$ **2 Marks**

Q62. State whether the following quadratic equations have two distinct real roots. Justify your answer. **2 Marks**

x(1 - x) - 2 = 0.

Q63. For the pair of equations λx + 3y = -7 and 2x + 6y = 14 to have infinitely many solutions, the value of λ should be 1. Is the statement true? Give reasons. **2 Marks**

Q64. State whether the following quadratic equations have two distinct real roots. Justify your answer. **2 Marks**

$2x^2$ + x - 1 = 0.

Q65. State whether the following quadratic equations have two distinct real roots. Justify your answer. **2 Marks**
$2x^2 - 6x + \frac{9}{2} = 0.$

Q66. State whether the following quadratic equations have two distinct real roots. Justify your answer. **2 Marks**
(x - 1)(x + 2) + 2 = 0.

Q67. Justify whether it is truw to say that $-1, \frac{-3}{2}, -2, \frac{5}{2}, \ldots\ldots$ froms an A.P. as $a_2 - a_1 = a_3 - a_2$ **2 Marks**

Q68. State whether the following quadratic equations have two distinct real roots. Justify your answer. **2 Marks**
$3x^2 - 4x + 1 = 0.$

Q69. State whether the following quadratic equations have two distinct real roots. Justify your answer. **2 Marks**
$(x + 4)^2 - 8x = 0.$

Q70. Two straight paths are represented by the equations x - 3y = 2 and -2x + 6y = 5. Check whether the paths cross each other or not. **2 Marks**

Q71. Answer the following and justify: **2 Marks**
Can the quadratic polynomial $x^2 + kx + k$ have equal zeroes for some odd integer k > 1?

Q72. Are the following pair of linear equations consistent? Justify your answer: **2 Marks**
x + 3y = 11 and 2(2x + 6y) = 22.

Q73. The taxi fare after each km, when the fare is Rs. 15 for the first km and Rs. 8 for each additional km, does not form an AP as the total fare (in Rs.) after each km is 15, 8, 8, 8 ..... Is the statement true? Give reasons. **2 Marks**

Q74. State whether the following quadratic equations have two distinct real roots. Justify your answer. **2 Marks**
(x + 1)(x - 2) + x = 0.

Q75. Can two numbers have 18 as their HCF and 380 as their LCM? Give reasons. **3 Marks**

Q76. If sum of first 6 terms of an AP is 36 and of the first 16 terms is 256, find the sum of first 10 terms. **3 Marks**

Q77. Find whether the following equations have real roots. If real roots exist, find them. **3 Marks**
$5x^2 - 2x - 10 = 0.$

Q78. Verify that each of the following is an AP, and then write its next three terms: $0, \frac{1}{4}, \frac{1}{2}, \frac{3}{4}, \ldots\ldots$ **3 Marks**

Q79. Prove that $\sqrt{p} + \sqrt{q}$ is irrational, where p, q are primes. **3 Marks**

Q80. Find the roots of the following quadratic equations by the factorisation method: **3 Marks**
$3x^2 + 5\sqrt{5}x - 10 = 0.$

Q81. Is 0 a term of the A.P: 31, 28, 25, 25, ...? Justify your answer. **3 Marks**

Q82. Determine the AP whose fifth term is 19 and the difference of the eighth term from the thirteenth term is 20. **3 Marks**

Q83. If the 9^{th} term of an AP is zero, prove that its 29^{th} term is twice its 19^{th} term. **3 Marks**

Q84. Find whether 55 is a term of the AP 7, 10, 13,--- or not. If yes, find which term it is. **3 Marks**

Q85. Explain why 3 × 5 × 7 + 7 is a composite number. **3 Marks**

Q86. Find the zeroes of the following polynomials by factorisation method and verify the relations between the zeroes and the coefficients of the polynomials: **3 Marks**
$3x^2 + 4x - 4.$

Q87. Find the roots of the following quadratic equations by the factorisation method: **3 Marks**
$3\sqrt{2}x^2 - 5x - \sqrt{2} = 0.$

Q88. Show that 12^n cannot end with the digit 0 or 5 for any natural number n. **3 Marks**

Q89. For the A.P: -3, -7, -11, ..., can we find directly $a_{30} - a_{20}$ without actually finding a_{30} and a_{20}? Give reasons for your answer. **3 Marks**

Q90. Find the sum: **3 Marks**
$4 - \frac{1}{n} + 4 - \frac{2}{n} + 4 - \frac{3}{n} + \ldots\ldots \text{upto n terms}.$

Q91. Find a, b and C such that the following numbers are in AP: **3 Marks**
a, 7, b, 23, C.

Q92. How many terms of the AP -15, -13, -11, ... are needed to make the sum -55? Explain the reason for double answer. **3 Marks**

Q93. Find the sum of first 17 terms of an AP whose 4^{th} and 9^{th} term are -15 and -30 respectively. **5 Marks**

Q94. If sum of the 3^{rd} and the 8^{th} terms of an AP is 7 and the sum of the 7^{th} and the 14^{th} terms is –3, find the 10^{th} term. **5 Marks**

Q95. Two numbers are in the ratio 5 : 6. If 8 is subtracted from each of the numbers, the ratio becomes 4 : 5. Find the numbers. **5 Marks**

Q96. Find the zeroes of the following polynomials by factorisation method and verify the relations between the zeroes and the coefficients of the polynomials: **5 Marks**
$4x^2 + 5\sqrt{2x} - 3.$

Q97. Find the zeroes of the following polynomials by factorisation method and verify the relations between the zeroes and the coefficients of the polynomials: **5 Marks**
$7y^2 - \frac{11}{3}y - \frac{2}{3}.$

Q98. Find the 12^{th} term from the end of the AP: **5 Marks**
–2, –4, –6,..., –100.

Q99. A train, travelling at a uniform speed for 360km, would have taken 48 minutes less to travel the same distance if its speed were 5km/hr more. Find the original speed of the train. **5 Marks**

Q100. Find the zeroes of the following polynomials by factorisation method and verify the relations between the zeroes and the coefficients of the polynomials: **5 Marks**
$2s^2 - (1 + 2\sqrt{2})s + \sqrt{2}.$

Q101. In a competitive examination, one mark is awarded for each correct answer while $\frac{1}{2}$ mark is deducted for every wrong answer. Jayanti answered 120 questions and got 90 marks. How many questions did she answer correctly? **5 Marks**

Q102. Jaspal Singh repays his total loan of Rs. 118000 by paying every month starting with the first instalment of Rs. 1000. If he increases the instalment by Rs. 100 every month, what amount will be paid by him in the 30^{th} instalment? What amount of loan does he still have to pay after the 30^{th} instalment? **5 Marks**

Q103. Find the sum of the integers between 100 and 200 that are- **5 Marks**
Divisible by 9.

Q104. There are some students in the two examination halls A and B. To make the number of students equal in each hall, 10 students are sent from A to B. But if 20 students are sent from B to A, the number of students in A becomes double the number of students in B. Find the number of students in the two halls. **5 Marks**

Q105. Find the sum: **5 Marks**
1 + (-2) + (-5) + (-8) + ... + (-236)

Q106. If $a_n = 3 - 4n$, show that $a_1, a_2, a_3, \ldots\ldots$ from an AP. also find S_{20}. **5 Marks**

Q107. Find the-
sum of those integers from 1 to 500 which are multiples of 2 as well as of 5. **5 Marks**

Q108. If Zeba were younger by 5 years than what she really is, then the square of her age (in years) would have been 11 more than five times her actual age. What is her age now? **5 Marks**

Q109. A two-digit number is obtained by either multiplying the sum of the digits by 8 and then subtracting 5 or by multiplying the difference of the digits by 16 and then adding 3. Find the number. **5 Marks**

Q110. The age of the father is twice the sum of the ages of his two children. After 20 years, his age will be equal to the sum of the ages of his children. Find the age of the father. **5 Marks**

Q111. By the graphical method, find whether the following pair of equations are consistent or not. If consistent, solve them: **5 Marks**
$x + y = 3$, $3x + 3y = 9$.

Q112. Find the sum of the integers between 100 and 200 that are- **5 Marks**
Not divisible by 9.
[**Hint:** These numbers will be: Total numbers – Total numbers divisible by 9]

Q113. At present Asha's age (in years) is 2 more than the square of her daughter Nisha's age. When Nisha grows to her mother's present age, Asha's age would be one year less than 10 times the present age of Nisha. Find the present ages of both Asha and Nisha. **5 Marks**