STATE LEVEL EXAM (2024 – 2025)

MATHS MARATHON Competition For Excellence	CLASS **7**

Total Questions : 100	**Total Marks : 100**	**Time : 1 hour**

INSTRUCTIONS TO THE STUDENT'S

1. Please do not open this question paper unless you are instructed to do so.
2. Additional 5 minutes will be given to the candidates for filling up the student's details before the start of the competition.
3. The paper consists of 5 different chapters of the textbook.
4. All questions are compulsory and consist of equal marks.
5. Each question is carrying 1 mark, there is no negative marking.
6. There is only one correct answer, hence mark one answer only.
7. Darken the circle with dark pencil or blue/black ball pen only.
8. Return the answer sheet along with the question paper to the supervisor at the end of the exam.
9. Extra Blank pages can be used for rough calculations

Name - _____

SCHOOL - _____

ROLL NO - _____ CLASS - _____

SECTION 1 - OPERATIONS ON ALGEBRAIC EXPRESSIONS

1. Add: -5a + 10b and -8a + 4b
   A) -13a + 14b B) -13a + 6b C) 3a + 14b

2. Add: $-9m^2 + 2n$ and $4m^2 - 6n$
   A) $-13m^2 + 8n$ B) $-5m^2 - 4n$ C) $-5m^2 - 8n$

3. Add: $(x^2 + 3y)$ and $(-x^2 + 5y)$
   A) $2x^2 + 8y$ B) $3y$ C) $8y$

4. Add: $(7x^2 - 2y^2)$ and $(-4x^2 + 6y^2)$
   A) $11x^2 + 8y^2$ B) $3x^2 + 4y^2$ C) $3x^2 - 8y^2$

5. Subtract: $(7x^2 - 5y^2)$ from $(2x^2 + 8y^2)$
   A) $-5x^2 - 13y^2$ B) $5x^2 - 13y^2$ C) $-5x^2 + 13y^2$

6. Subtract: $(x^2 + 2y)$ from $(3x^2 - 5y)$
   A) $2x^2 + 7y$ B) $4x^2 - 3y$ C) $2x^2 - 7y$

7. Multiply: $-7p$ x $4p$
   A) $-28p^2$ B) $28p^2$ C) $-11p^2$

8. Multiply: $-5m^2n$ x $4mn^3$
   A) $20m^3n^4$ B) $-20m^3n^4$ C) $-20m^2n^4$

9. Multiply: $2a^2$ x $(5a^2 + 3a - 6)$
   A) $7a^4 + 6a^3 - 12a^2$ B) $10a^4 + 3a^3 - 12a$ C) $10a^4 + 6a^3 - 12a^2$

10. Multiply: $-4y$ x $(3y + 7)$
    A) $-12y^2 + 28y$ B) $-12y^2 - 28y$ C) $12y^2 - 28y$

11. Expand $(x - 3)(x^2 + 2x - 4)$:
    A) $x^3 - 5x^2 - 10x - 12$ B) $x^3 - x^2 - 10x - 12$ C) $x^3 - x^2 - 10x + 12$

12. Simplify $(x^2 + 4)(x^2 - 3x + 5)$:
    A) $x^4 - 3x^3 + 9x^2 - 12x + 20$ B) $x^4 - 3x^3 + 9x^2 + 20$
    C) $x^4 - 3x^3 + 9x^2 + 15x + 20$

13. $5x + 3(2x - 1) = 7x + 1$
    A) 2 B) 1 C) 3

14. $2(x + 3) - 3(x - 1) = x + 7$
    A) 3 B) 1 C) 4

15. $\frac{(z+2)}{3} - \frac{(z-1)}{2} = 1$

A) 4 B) 1 C) 6

16. $2(x + 5) + 3(2x - 1) = 4(x + 3) + 3$

A) 0 B) 1 C) 2

17. The cost of 3 pens and 4 notebooks is ₹68. If the cost of one notebook is ₹8, find the cost of one pen.

A) ₹12 B) ₹8 C) ₹10

18. A father's age is three times his son's age. In 5 years, their combined age will be 70. Find the son's current age.

A) 15 B) 20 C) 18

19. A man spends one-third of his income on rent, one-fifth on food, and saves the remaining ₹455. Find his total income.

A) 900 B) 180 C) 975

20. A number is 4 more than three times another number. If the sum of the numbers is 20, find the two numbers.

A) 4, 16 B) 16, 4 C) 5, 15

SECTION 2 - DIRECT PROPORTION AND INVERSE PROPORTION

21. If the speed of a car increases, the time taken to cover a fixed distance decrease. This is an example of:

A) Direct Proportion B) Inverse Proportion C) No Proportion

22. If the number of pages in a book and the time required to read them are inversely proportional, which of the following would hold true?

A) More pages mean less time to read.

B) More pages mean more time to read.

C) The time to read remains constant regardless of the number of pages.

23. In a direct proportion, if y = 4 when x = 2, what is the constant of proportionality?

A) 6 B) 3 C) 2

24. A tank fills with water at a rate of 100 liters in 20 minutes. How much water will fill in 1 hour?

A) 200 liters B) 300 liters C) 400 liters

25. The time taken to complete a job is inversely proportional to the number of workers. If 12 workers can complete the job in 15 days, how many days will 6 workers take to complete the same job?

A) 30 days B) 20 days C) 25 days

26. A machine produces 240 items in 8 hours. How many items will it produce in 12 hours?

A) 320 items B) 360 items C) 400 items

27. A printing press can print 600 pages in 50 minutes. How long will it take to print 1800 pages?

A) 2 hours and 30 minutes B) 2 hours C) 2 hours and 15 minutes

28. A pipe fills a tank with 90 liters of water in 12 minutes. How much water will the pipe fill in 1 hour?

A) 350 liters B) 420 liters C) 450 liters

29. A team of 6 painters can paint a house in 10 days. How many painters are needed to paint the house in 4 days, assuming direct proportion?

A) 15 painters B) 18 painters C) 12 painters

30. If 8 men can complete a task in 18 days, how many men will be needed to complete the task in 12 days?

A) 10 men B) 12 men C) 14 men

31. A tank is filled by a pipe in 10 hours. How long will it take to fill the tank with 5 pipes?

A) 1 hour B) 3 hours C) 2 hours

32. A job that can be done by 6 workers in 12 days can be completed in how many days by 24 workers?

A) 6 days B) 3 days C) 4 days

33. A car travels 240 km in 4 hours at a constant speed. How far will it travel in 6 hours at the same speed?

A) 360 km B) 300 km C) 400 km

34. If 6 workers can complete a task in 10 hours, how long will 15 workers take to complete the same task (assuming inverse proportion)?

A) 4 hours B) 6 hours C) 5 hours

35. The amount of water consumed is directly proportional to the number of people in a household. If a family of 4 uses 100 liters of water daily, how much water will a family of 6 use?

A) 120 liters B) 180 liters C) 150 liters

36. The cost of 6 pencils is ₹18. What will be the cost of 10 pencils?

A) ₹25 B) ₹28 C) ₹30

37. If 10 liters of water cost $15, how much would 30 liters cost assuming a direct proportion?

A) $30 B) $45 C) $50

38. The amount of money earned by a worker is directly proportional to the number of hours worked. If a worker earns $120 for 8 hours, how much would the worker earn for 15 hours?

A) $150 B) $225 C) $180

39. If y is inversely proportional to x, and y = 3 when x = 2, what is the value of y when x = 5?

A) 1.2 B) 7.5 C) 0.5

40. If the speed of a car is inversely proportional to the time taken for a journey, and the car takes 4 hours to cover a distance at a speed of 60 km/h, how much time will it take if the speed is increased to 120 km/h?

A) 4 hours B) 3 hours C) 2 hours

SECTION 3 - CIRCLE, PERIMETER AND AREA

41. What is the formula for the circumference of a circle using its diameter?

A) $C = \pi \times d$ B) $C = d/\pi$ C) $C = 2\pi\ d$

42. A wheel has a radius of 0.5 meters. How far will it travel in one complete revolution?

A) 3.14 m B) 1.57 m C) 6.28 m

43. Lisa walks around a square park with a side length of 25 m. How far does she walk if she completes one lap?

A) 50 m B) 75 m C) 100 m

44. A square gift box has a side length of 10 cm. What is the length of ribbon required to wrap around its edges once?

A) 30 cm B) 40 cm C) 50 cm

45. A painting is rectangular, with a length of 24 cm and a width of 18 cm. How much material is required to frame it?

A) 72 cm B) 96 cm C) 84 cm

46. A rectangular playground has a length of 60 m and a width of 40 m. How much fencing is needed to enclose it?

A) 160 m B) 200 m C) 220 m

47. A square poster has sides measuring 8 cm. What is the total area of the poster?

A) 56 cm^2 B) 72 cm^2 C) 64 cm^2

48. A square table has sides of 6 m each. What is the area of the table's surface?

A) 30 m^2 B) 36 m^2 C) 42 m^2

49. A rectangular poster has a length of 14 cm and a width of 10 cm. Find area of poster?

A) 120 cm^2 B) 150 cm^2 C) 140 cm^2

50. A rectangular wall has a length of 9 m and a width of 5 m. What is the area of the wall?

A) 50 m² B) 45 m² C) 40 m²

51. A triangular signboard has a base of 15 m and a height of 10 m. What is the area of the signboard?

A) 50 m² B) 100 m² C) 75 m²

52. A ramp for a playground is in the shape of a right-angled triangle with a base of 20 m and a height of 12 m. What is its area?

A) 300 m² B) 240 m² C) 120 m²

53. A triangular painting has an area of 75 cm² and a base of 15 cm. What is its height?

A) 5 cm B) 10 cm C) 15 cm

54. The area of a triangular park is 84 m², and its height is 14 meters. Find the base.

A) 12 m B) 8 m C) 16 m

55. A gift box is shaped like a cube with a total surface area of 150 cm². What is the length of one side?

A) 15 cm B) 10 cm C) 5 cm

56. A box in the shape of a cube has a side length of 10 meters. What is its total surface area?

A) 600 m² B) 1000 m² C) 1200 m²

57. The total surface area of a cube is 216 cm². Find the side length of the cube.

A) 4 cm B) 6 cm C) 9 cm

58. A wooden box is 15 cm long, 10 cm wide, and 8 cm high. Find its total surface area.

A) 740 cm² B) 720 cm² C) 700 cm²

59. A cuboidal storage unit has a surface area of 332 cm². If its length is 14 cm, width is 8 cm, and height is h cm, find h.

A) 2.30 cm B) 2.45 cm C) 3.25 cm

60. A room has dimensions 5 m × 4 m × 3 m. What is its total wall and ceiling surface area?

A) 84 m² B) 94 m² C) 74 m²

SECTION 4 - SIMPLE INTEREST / PYTHAGORAS' THEOREM

61. A sum of ₹12,000 is invested for 5 years at simple interest. If the total amount at the end is ₹18,000, find the rate of interest per annum.

A) 8% B) 10% C) 12%

62. A certain sum of money is lent at 10% per annum simple interest. If the interest earned in 5 years is ₹6,000 more than the principal, find the principal.

A) ₹10,000 B) ₹15,000 C) ₹12,000

63. A person deposits ₹8,000 in a bank for 5 years at 10% per annum. If he withdraws ₹4,000 after 2 years, how much simple interest will he earn by the end of 5 years?

A) ₹2,640 B) ₹2,800 C) ₹2,000

64. A person invested ₹8,000 at 7% simple interest for 3 years. What is the total interest earned at the end of 3 years?

A) ₹1,680 B) ₹1,200 C) ₹2,000

65. A sum of ₹2,500 is invested at 10% per annum simple interest. How long will it take for the investment to double?

A) 5 years B) 10 years C) 12 years

66. A person invested ₹20,000 for 2 years and ₹30,000 for 3 years at the same rate of simple interest. If the total interest earned is ₹7,800, find the rate of interest.

A) 7% B) 9% C) 6%

67. If the principal is ₹15,000, the rate of interest is 5% per annum, and the time is 2 years, what is the simple interest?

A) ₹1,500 B) ₹2,000 C) ₹2,500

68. Ramesh deposited ₹10,000 in a bank at 6% per annum simple interest. How much interest will he get after 2 years?

A) ₹1,200 B) ₹2,000 C) ₹600

69. How long will it take for ₹6,000 to become ₹7,800 at a 5% per annum simple interest rate?

A) 4 years B) 6 years C) 8 years

70. A bank offers 8% simple interest per annum. If Rahul deposits ₹20,000 for 3 years, how much total amount will he receive at the end?

A) ₹24,800 B) ₹25,000 C) ₹28,000

71. Which of the following satisfies the Pythagorean theorem?

A) (9, 12, 15) B) (11, 13, 15) C) (14, 20, 26)

72. Which of the following NOT forms a Pythagorean triplet?

A) (28, 45, 53) B) (16, 64, 65) C) (12, 35, 37)

73. A kite is flying 15 meters above the ground. The string measures 25 meters is tied to the ground. What is horizontal distance between the kite and the point where the string is tied?

A) 18 meters B) 22 meters C) 20 meters

74. A square playground has a side of 10 meters. What is the length of the diagonal of the playground?

A) $12\sqrt{2}$ meters B) $10\sqrt{2}$ meters C) $14\sqrt{2}$ meters

75. A drone flies 10 meters north and then 24 meters east. What is the shortest distance back to the starting point?

A) 30 meters B) 28 meters C) 26 meters

76. A surveyor measures the distance from the base of a mountain to a point directly below the peak as 300 meters. If the diagonal distance to the peak is 500 meters, how high is the mountain?

A) 300 meters B) 400 meters C) 450 meters

77. A ladder is 10 m long and leans against a wall. The foot of the ladder is 6 m away from the base of the wall. How high does the ladder reach?

A) 8 m B) 9 m C) 7 m

78. A boy walks 3 km east and then 4 km north. What is the shortest distance between his starting and ending points?

A) 6 km B) 5 km C) 7 km

79. A tree casts a shadow 24 m long. If the tree is 18 m tall, find the distance from the top of the tree to the tip of the shadow.

A) 30 m B) 36 m C) 40 m

80. A drone flies 8 m up from the ground and then moves 15 m horizontally. How far is it from its starting point?

A) 17 m B) 20 m C) 16 m

SECTION 5 - ALGEBRAIC EXPRESSIONS - EXPANSION OF SQUARES

81. What is the expanded form of $(5a + 2)^2$?

A) $25a^2 + 10a + 4$ B) $25a^2 + 20a + 4$ C) $25a^2 + 10a + 2$

82. What is the expanded form of $(2x + 3y)^2$?

A) $2x^2 + 6xy + 3y^2$ B) $4x^2 + 6xy + 9y^2$ C) $4x^2 + 12xy + 9y^2$

83. The expanded form of $(3x + 2y)^2$ is:

A) $9x^2 + 12xy + 4y^2$ B) $9x^2 + 6xy + 4y^2$ C) $9x^2 + 4xy + 4y^2$

84. The expanded form of $(4a + 3b)^2$ is:

A) $16a^2 + 6ab + 9b^2$ B) $16a^2 + 12ab + 9b^2$ C) $16a^2 + 24ab + 9b^2$

85. The expanded form of $(a + 6)(a - 6)$ is:

A) $a^2 - 36$ B) $a^2 + 36$ C) $a^2 + 12a - 36$

86. What is the result of $(2y + 4)(2y - 4)$?

A) $4y^2 + 16$ B) $4y^2 - 16$ C) $4y^2 - 8y + 16$

87. What is the factorization of $4x^2 - 25$?

A) $(2x + 25)(2x - 5)$ B) $(4x - 5)(4x + 5)$ C) $(2x - 5)(2x + 5)$

88. The factorization of $16a^2 - 81b^2$ is:

A) $(4a - 81b)(4a + 81b)$ B) $(16a - 81b)(16a + 81b)$ C) $(4a - 9b)(4a + 9b)$

89. Simplify the expression $(a + 3)(a - 4)$:

A) $a^2 - 12a + 12$ B) $a^2 - a - 12$ C) $a^2 - a - 12a + 12$

90. What is the expanded form of $(p - 7)(p + 7)$?

A) $p^2 - 49$ B) $p^2 + 49$ C) $p^2 - 14p + 49$

91. The expanded form of $(a + 10)(a - 10)$ is:

A) $a^2 + 100$ B) $a^2 - 100$ C) $a^2 + 20a - 100$

92. What is the expanded form of $(3x + 7)(3x - 7)$?

A) $9x^2 - 49$ B) $9x^2 + 49$ C) $9x^2 - 21x + 49$

93. Expand $(3y + 4)^2$.

A) $3y^2 + 12y + 16$ B) $9y^2 + 16y + 16$ C) $9y^2 + 24y + 16$

94. Simplify $64y^2 - 36z^2$.

A) $(4y - 3z)(4y + 3z)$ B) $(16y - 12z)(16y + 12z)$ C) $(8y - 6z)(8y + 6z)$

95. Expand $(3y - 4)^2$.

A) $9y^2 - 24y + 16$ B) $9y^2 - 12y + 16$ C) $9y^2 - 24y + 64$

96. Expand $(2y - 3)^2$.

A) $4y^2 - 6y + 3$ B) $4y^2 - 6y + 9$ C) $4y^2 - 12y + 9$

97. Simplify $(7a + 9)(7a - 9)$.

A) $49a^2 - 81$ B) $49a^2 + 81$ C) $49a^2 - 126a + 81$

98. Simplify $(3x + 10)(3x - 10)$.

A) $9x^2 + 100$ B) $9x^2 - 100$ C) $9x^2 - 30x + 100$

99. Expand $(2x + 7)^2$.

A) $4x^2 + 14x + 49$ B) $4x^2 + 28x + 49$ C) $4x^2 + 14x + 7$

100. Simplify $196x^2 - 81y^2$.

A) $(14x - 9y)(14x + 9y)$ B) $(14x + 9y)(14x + 9y)$ C) $(196x - 81y)(196x + 81y)$

ANSWER KEY

QUE	ANS	QUE	ANS	QUE	ANS	QUE	ANS	QUE	ANS
1	A	**21**	B	**41**	A	**61**	B	**81**	B
2	B	**22**	A	**42**	A	**62**	C	**82**	C
3	C	**23**	C	**43**	C	**63**	B	**83**	A
4	B	**24**	B	**44**	B	**64**	A	**84**	C
5	C	**25**	A	**45**	C	**65**	B	**85**	A
6	C	**26**	B	**46**	B	**66**	C	**86**	B
7	A	**27**	A	**47**	C	**67**	A	**87**	C
8	B	**28**	C	**48**	B	**68**	A	**88**	C
9	C	**29**	A	**49**	C	**69**	B	**89**	B
10	B	**30**	B	**50**	B	**70**	A	**90**	A
11	C	**31**	C	**51**	C	**71**	A	**91**	B
12	A	**32**	B	**52**	C	**72**	B	**92**	A
13	B	**33**	A	**53**	B	**73**	C	**93**	C
14	B	**34**	A	**54**	A	**74**	B	**94**	C
15	B	**35**	C	**55**	C	**75**	C	**95**	A
16	C	**36**	C	**56**	A	**76**	B	**96**	C
17	A	**37**	B	**57**	B	**77**	A	**97**	A
18	A	**38**	B	**58**	C	**78**	B	**98**	B
19	C	**39**	A	**59**	B	**79**	A	**99**	B
20	B	**40**	C	**60**	C	**80**	A	**100**	A