SECOND DRAFT OF ACHIEVEMENT TEST IN MATHEMATICS

DEVELOPED BY
(INVESTIGATOR)

DEPARTMENT OF EDUCATION
PANJAB UNIVERSITY
CHANDIGARH
SECOND DRAFT OF ACHIEVEMENT TEST

Name................................. Class................... Roll No.............
Sex.................. School ....................... Date.....................

General Instructions

(i) Do not turn this page until you are told to do so.
(ii) Firstly fill your bio-data given above.
(iii) Read each question carefully. Each question in this test is followed by four options (a, b, c, d). You have to choose the correct response and write it against the serial number of the question given in the separate answer sheet.
(iv) Each question has one mark. If you want to change your answer, do so by rewriting it.
(v) Do not write anything on the question paper.
(vi) After solving question paper, handover both question paper and answer sheet to the teacher.
(vii) The maximum marks for the test are 71 and time limit for the test is 60 minutes.
1. Which one of the following is a pure surd?
   (a) \( \sqrt{5} \)  (b) \( \sqrt{25} \)  (c) \( \sqrt{27} \)  (d) \( \sqrt{9} \)

2. Which one of the following is irrational number?
   (a) 0.15  (b) \( \frac{1}{2} \)  (c) \( \sqrt{2} \)  (d) 8

3. Which one of following is a surd?
   (a) \( \sqrt{3} \times \sqrt{6} \)  (b) \( \sqrt{7} \times \sqrt{7} \)  (c) \( \frac{y}{27} \times V3 \)

4. Match the following:
   
   (A) \( \sqrt{32} \)  (i) 3
   (B) \( \sqrt{9} \)  (ii) \( 4\sqrt{2} \)
   (C) \( \sqrt{25} \)  (iii) 4
   (D) \( \sqrt{16} \)  (iv) 5
   
   A   B   C   D
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   (b) (i) (ii) (iii) (iv)
   (c) (iii) (iv) (i) (ii)
   (d) (iv) (ii) (iii) (i)

5. The decimal representation of \( \frac{11}{1000} \) is
   (a) 0.0011  (b) 0.011  (c) 0.11  (d) 0.00011

6. The rationalised form of \( \frac{\sqrt{5}+1}{\sqrt{5}-1} \) is
   (a) \( 3 + \sqrt{5} \)  (b) \( 3 - \sqrt{5} \)  (c) \( \frac{1+\sqrt{5}}{2} \)  (d) \( \frac{3-\sqrt{5}}{2} \)

7. Express \( \frac{2\sqrt{7}}{\sqrt{11}} \) as an expression with rational denominator
   (a) \( \frac{2\sqrt{77}}{11} \)  (b) \( 2\sqrt{77} \)  (c) \( \frac{2\sqrt{77}}{\sqrt{11}} \)  (d) \( \sqrt{77} \)

8. Express \( \frac{3}{4} \) in decimal form
   (a) 0.75  (b) 0.70  (c) 0.80  (d) 0.72

9. Express \( 3.\overline{2} \) in the form of \( \frac{p}{q} \)
   (a) \( \frac{29}{9} \)  (b) \( \frac{20}{9} \)  (c) \( \frac{11}{9} \)  (d) \( \frac{35}{18} \)

10. Match the following identities:
    (A) \( a^3 + b^3 \)  (i) \( (a-b)(a^2 + ab + b^2) \)
    (B) \( a^3 - b^3 \)  (ii) \( (a+b)(a^2 - ab + b^2) \)
    (C) \( a^4 - b^4 \)  (iii) \( (a+b)(a-b) \)
    (D) \( a^2 - b^2 \)  (iv) \( (a+b)(a^2 + b^2)(a-b) \)
### Appendix - D

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11. Factorize: $4 - 100x^2$
   - (a) $(1 - 5x)(1 + 5x)$
   - (b) $4(1 - 5x)(1 + 5x)$
   - (c) $(1 - 5x)^2$
   - (d) $(1 + 5x)^2$

12. Factorization of $x^4 - 81$ is
   - (a) $(x^2 + 3)(x + 3)(x - 3)$
   - (b) $(x^2 - 3)(x + 3)(x - 3)$
   - (c) $(x^2 + 9)(x + 3)(x - 3)$
   - (d) $(x^2 - 3)(x + 3)(x - 3)$

13. Factorize: $y^3 - y$
   - (a) $y(y - 1)(y + 1)$
   - (b) $y(y - 1)$
   - (c) $y(y + 1)$
   - (d) $(y + 1)^2$

14. Factorization of $2x^2 + 7x + 3$ is
   - (a) $(x + 1)(2x + 3)$
   - (b) $(x + 3)(2x + 3)$
   - (c) $(2x + 1)(x + 3)$
   - (d) $(x + 3)(2x + 3)$

15. One factor of $x^2 - 2x + 1$ is
   - (a) $(x - 2)$
   - (b) $(x - 1)$
   - (c) $(x + 2)$
   - (d) $(x + 1)$

16. Factorise: $9x^2 - 6xy$
   - (a) $3x(3x + 2y)$
   - (b) $3x(3x - 2y)$
   - (c) $3x^2(3x + 2y)$
   - (d) $3x^2(3x - 2y)$

17. The value of identity $(a + b)^3$ is
   - (a) $a^3 + b^3 - 3a^2b - 3ab^2$
   - (b) $a^3 - b^3 - 3a^2b + 3ab^2$
   - (c) $a^3 + b^3 + 3a^2b + 3ab^2$
   - (d) $a^3 - b^3 - 3a^2b - 3ab^2$

18. The value of $x^2 - 25$ is
   - (a) $(x - 5)^2$
   - (b) $(x + 5)^2$
   - (c) $(x + 5)(x - 5)$
   - (d) $(x + 5)$

19. The value of $x$ for the equation $x + 8 = 4x + 8$ is
   - (a) 1
   - (b) 2
   - (c) 3
   - (d) 0

20. The value of $x$ for the equation $x + 4 = 3x$ is
   - (a) 2
   - (b) 3
   - (c) 4
   - (d) 5

21. Match the following points to the quadrant in which they lie:
   - (A) $(2, -3)$
   - (B) $(-2, 3)$
   - (C) $(-2, -3)$
   - (D) $(2, 3)$
   - (i) $1^{st}$/first
   - (ii) $3^{rd}$/third
   - (iii) $2^{nd}$/second
   - (iv) $4^{th}$/fourth
22. If \( x = 3 \) is a solution of \( 3x - 2y = -1 \), then the value of \( y \) is
(a) 3 (b) 5 (c) 2 (d) 1

23. Solve \( 7 - 4(x - 3) = 3 \) for the value of \( x \)
(a) 1 (b) 2 (c) 3 (d) 4

24. Which of the following points lie on the x-axis?
(5, 0), (0, -3), (2, 2), (0, 1), (1, 1), (-1, 0)
(a) (0, -3), (0, 1) (b) (5, 0), (-1, 0) (c) (2, 2), (1, 1) (d) (0, -3), (2, 2)

25. Which of the following points lie on the y-axis?
(7, 0), (1, -2), (2, 2), (0, 2), (0, -1), (-4, 0)
(a) (0, 2), (0, -1) (b) (7, 0), (-4, 0) (c) (2, 2), (1, -2) (d) (7, 0), (2, 2)

26. Solve the following equation:
\[ m - 7 = 4m + 8 \]
(a) 4 (b) 5 (c) -4 (d) -5

27. All points lying on the same line are known as ________ points.
(a) Coplanar (b) Collinear (c) Vertex (d) None of these

28. Which of the following pairs are supplementary?
(a) 30°, 120° (b) 40°, 140° (c) 30°, 60° (d) 40°, 50°

29. Find the angle complementary to the angle 50°
(a) 40° (b) 90° (c) 130° (d) 100°

30. The angles of a triangle are in 3:5:10. Find three angles?
(a) 50°, 30°, 100° (b) 100°, 30°, 50° (c) 30°, 50°, 100° (d) 30°, 100°, 50°

31. In given figure, OM and ON are opposite rays. If \( \angle MOP = 70° \), find \( \angle NOP \).
(a) 120° (b) 90° (c) 110° (d) 100°

32. A point has no ________.
(a) Vertex (b) End (c) Dimension (d) Start

33. The common point between the arms of an angle is known as ________.
(a) Collinear (b) Vertex (c) Non-collinear (d) Coplanar
34. Non-intersecting lines are also known as _______ lines.
   (a) Equal   (b) Concurrent   (c) Parallel   (d) Collinear

35. The lines which have one common point lying on them are known as _______ lines.
   (a) Parallel   (b) Intersecting   (c) Concurrent   (d) Coplanar

36. If one angle made by two intersecting lines is 30°, then the vertically opposite angle to that angle is
   (a) 60°   (b) 30°   (c) 90°   (d) 360°

37. What is the angle measure of straight line?
   (a) 180°   (b) 90°   (c) 360°   (d) 270°

38. If one angle of a linear pair is obtuse then other must be _______.
   (a) Acute   (b) Obtuse   (c) Right angle   (d) Reflex angle

39. Match the following by reducing into simplest form:

   (A) \(\frac{45}{35}\)   (B) \(\frac{30}{10}\)   (C) \(\frac{25}{15}\)   (D) \(\frac{45}{9}\)
   (i) \(\frac{5}{3}\)   (ii) 5   (iii) \(\frac{9}{7}\)   (iv) 3

   A   B   C   D
   (a) (ii) (i) (iv) (iii)
   (b) (iii) (iv) (i) (ii)
   (c) (iv) (iii) (ii) (i)
   (d) (iv) (ii) (iii) (i)

40. Which ratio is greater: \(\frac{3}{5}\) or \(\frac{7}{8}\)
   (a) \(\frac{3}{5}\)   (b) \(\frac{7}{8}\)   (c) Both \(\frac{3}{5}\) and \(\frac{7}{8}\)   (d) Neither \(\frac{3}{5}\) nor \(\frac{7}{8}\)

41. Find the compounded ratio of 2:3, 4:5
   (a) 8:15   (b) 6:8   (c) 2:8   (d) 2:4

42. What must be added to 6, 10, 14, and 22 so that they become proportional?
   (a) 2   (b) 3   (c) 4   (d) 5

43. Apply componendo and dividendo to \(\frac{x}{2} = \frac{y}{4}\)
   (a) \(\frac{x-2}{x+2} = \frac{y-4}{y+4}\)   (b) \(\frac{x+2}{x-2} = \frac{y+4}{y-4}\)
44. What is the ratio of cost of a car Rs 35,00,000 to weight of an elephant 15 tonnes?
   (a) $\frac{700}{3}$  (b) $\frac{70}{3}$  (c) $\frac{7}{3}$  (d) Question is absurd

45. Find the value of a for which 3: a :: 12:20
   (a) 5  (b) 10  (c) 15  (d) 20

46. Find a fourth proportional to 8, 14, and 16
   (a) 20  (b) 28  (c) 25  (d) 30

47. Find a third proportional to 4 and 8
   (a) 15  (b) 17  (c) 16  (d) 18

48. Find the mode of the following data:
   8, 13, 11, 17, 8, 5, 11, 7, 15, 14, 8
   (a) 8  (b) 5  (c) 11  (d) 14

49. The unorganised and unarranged data is called __________ data.
   (a) Raw or Ungrouped  (b) Grouped  (c) Primary  (d) Secondary

50. The observation having maximum frequency in the given data is called __________.
   (a) Mean  (b) Median  (c) Mode  (d) Standard deviation

51. The numerical observation collected in statistics is called __________.
   (a) Data  (b) Scores  (c) Numbers  (d) Digits

52. Find the mean of the following data:
   10, 15, 5, 25, 20
   (a) 15  (b) 10  (c) 18  (d) 20

53. If the mean of 10, 12, 15, 14, 8, k, 9, 12, 17, 13 is 12. Find the value of k?
   (a) k = 20  (b) k = 10  (c) k = 15  (d) k = 25

54. Find the median of the following data:
   15, 35, 18, 24, 20, 25, 29, 17, 21
   (a) 21  (b) 18  (c) 20  (d) 29

55. The class mark of class interval 20 — 30 is
   (a) 30  (b) 25  (c) 60  (d) 50

56. Match the following:
   (A) The upper limit of class interval 20 — 30 .................. (i) 20
   (B) The lower limit of class interval 20 — 30 ................. (ii) 50
   (C) The lower limit of class interval 50 — 60 ................. (iii) 60
   (D) The upper limit of class interval 50 — 60 ................. (iv) 30

   A  B  C  D
   (a) (iv) (i) (ii) (iii)
   (b) (i) (ii) (iii) (iv)
   (c) (iii) (iv) (i) (ii)
   (d) (ii) (i) (iv) (iii)
57. The class marks of a distribution are 30, 50, 70, 90, 110 and 130. Determine the class size.
   (a) 10 (b) 20 (c) 15 (d) 5

58. How many sides are there in the quadrilateral?
   (a) Two (b) Four (c) Three (d) Five

59. Every rectangle is also a
   (a) Square (b) Rhombus (c) Parallelogram (d) Trapezium

60. If length of one diagonal of square is 8cm, then length of other diagonal is
   (a) 8cm (b) 16cm (c) 4cm (d) 10cm

61. The sum of four angles of a quadrilateral is
   (a) 360° (b) 180° (c) 420° (d) 90°

62. If the length of one side of Rhombus is 3cm, then what will be length of each other
   sides of rhombus?
   (a) 3cm (b) 6cm (c) 18cm (d) 9cm

63. If a diagonal of parallelogram divides it in two triangles and area of one triangle is
   25cm², then the area of other triangle is
   (a) 25 cm² (b) 5 cm² (c) 12.5 cm² (d) 50 cm²

64. If one side of rectangle is of length 10cm, then its opposite side must be of length
   (a) 10cm (b) 15cm (c) 5cm (d) 20cm

65. If ABCD is a parallelogram and angle A = 70°, then find angle C?
   (a) 70° (b) 130° (c) 110° (d) 290°

66. In a parallelogram the opposite angles are
   (a) Supplementary (b) Equal (c) Complementary (d) Neither supplementary nor complementary

67. If one side of parallelogram is 10cm, then its opposite side must be of length
   (a) 5cm (b) 10cm (c) 15cm (d) 20cm

68. If one side of square is 2cm, then what is the length of each side of square?
   (a) 2cm (b) 4cm (c) 6cm (d) 8cm

69. In a parallelogram, the diagonals
   (a) Bisect each other (b) Bisect at 90° (c) Perpendicular (d) Equal

70. The figure formed by joining the mid points of a quadrilateral is
   (a) Rhombus (b) Parallelogram (c) Triangle (d) Rectangle

71. If a pair of opposite side are equal and parallel in a quadrilateral, then it is a
   (a) Rhombus (b) Parallelogram (c) Trapezium (d) Square

31
**ANSWER SHEET**

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