**11** The Competition in
# Advanced Mathematics Skills

# Advanced Maths Test I & II

# *MODEL PAPERS*

## Class : IX

## Eduranet
### Intellectual Olympiad Foundation
(Promoted by Eduranet Educational Society (Regd. 309/09))

**Hyderabad | India**

# Eduranet Intellectual Olympiad Foundation

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# SYLLABUS

1. Number Systems

2. Polynomials

3. Coordinate Geometry

4. Linear Equations in Two Variables

5. Introduction to Euclid's Geometry

6. Lines and Angles

7. Triangles

8. Quadrilaterals,

9. Area of Parallelograms and Triangles

10. Circles

11. Constructions

12. Heron's Formula

13. Surface Area and Volumes

14. Statistics

15. Probability

# *TABLE OF CONTENTS*

# ADVANCED MATHS TEST-I

Code : 1191        **PRELIMS**

**Max. Marks : 75**                    **Duration : 75 Mins.**

**General Instructions :**

1. Please find the Answer Sheets (OMR) with in the envelop given to you.
2. Mention your Test Code, Student ID, Name, Class, Section and School Name on the OMR Sheet as per Question Paper and Hall Ticket.
3. This question paper contains 75 Questions, duration is 75 minutes.
4. Do rough work in the empty sheet provided along with this question paper.
5. Answer questions in OMR sheet only.
6. Don't write or tick anything on the question paper.
7. Use only Black or Blue Ball Point Pen or Dark Perncil to answer the question in OMR sheet.
8. Indicate the correct answer by darkening one of the 4 or 5 responses provided.
9. Submit only OMR sheet to the invigilator

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1. **The value of** $\sqrt[3]{(64)^{-2}}$

   a) $\dfrac{1}{2}$          b) $\dfrac{1}{16}$          c) $\dfrac{1}{4}$          d) $\dfrac{1}{2}$

2. **Find the value of** $2.\overline{6} - 0.\overline{9}$

   a) $\dfrac{5}{3}$          b) $\dfrac{5}{7}$          c) $\dfrac{7}{5}$          d) $\dfrac{3}{5}$

3. **Find** $y = \sqrt{6 + \sqrt{6 + \sqrt{6 + \dots \infty}}}$

   a) 6          b) 4          c) 2          d) 3

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**4.** If $\left(\dfrac{2}{3}\right)^6 \times \left(\dfrac{9}{4}\right)^5 = \left(\dfrac{3}{2}\right)^{m+2}$ then the value of m is

a) 9                b) -2                c) 2                d) 4

**5.** If $\left[\left\{\left(\dfrac{1}{7^2}\right)^{-2}\right\}^{-1/3}\right]^{\frac{1}{4}} = 7^m$, then find the value of m.

a) $\dfrac{-2}{3}$          b) $\dfrac{-1}{3}$          c) $\dfrac{-6}{5}$          d) $\dfrac{3}{2}$

**6.** Express $0.12\bar{3}\ in\ \dfrac{p}{q}$ form ?

a) $\dfrac{100}{37}$          b) $\dfrac{37}{300}$          c) $\dfrac{37}{1000}$          d) $\dfrac{37}{10}$

**7.** If x = $9 - 4\sqrt{5}$ find the value of $\sqrt{x} - \dfrac{1}{\sqrt{x}}$

a) $-3$          b) $-5$          c) $-4$          d) $-6$

**8.** Find the value of 'a' in the following :

$$\dfrac{6}{3\sqrt{2} - 2\sqrt{3}} = 3\sqrt{2} - a\sqrt{3}$$

a) $-3$          b) $-1$          c) $-2$          d) $-4$

**9.** If the three vertices of a rectangle taken in order are the points (2,-2), (8,4) and (5,7). The co-ordinates of the fourth vertex is –

a) (1,1)                          b) (1,–1)

c) (–1,1)                         d) None of these

---

10. **Find the ratio in which the point $\left(\frac{1}{2}, 6\right)$ divides the line segment joining the points (3,5) and (-7,9).**

    a) 1 : 2               b) 1 : 5

    c) 1: 3               d) 1 : 7

11. **The centroid of a triangle, whose vertices are (2,1), (5,2) and (3,4) is -**

    a) $\left(\frac{8}{3}, \frac{7}{3}\right)$          b) $\left(\frac{10}{3}, \frac{7}{3}\right)$

    c) $\left(-\frac{10}{3}, \frac{7}{3}\right)$          d) $\left(\frac{10}{3}, -\frac{7}{3}\right)$

12. **Find the area of the circle whose centre is (–1, –2) and (3, 4) is a point on the circle**

    a) $42\pi$ sq unit          b) $32\pi$ squnit

    c) $25\pi$ squnit          d) $52\pi$ squnit

13. **The quadrilateral, whose vertices are (–1,1), (0,-3), (5,2) and (4,6) is**

    a) a square          b) a rectangle

    c) a rhombus          d) a parallelogram

14. **Determine the ratio in which the point P(a, –2) divides the join of A(–4, 3) and B(2,–4). then find the value of a.**

    a) $\frac{3}{7}$      b) $\frac{1}{7}$      c) $\frac{2}{7}$      d) $\frac{5}{7}$

15. **The points of triangle are (a,a), (–a,–a) and $\left(-\sqrt{3a}, \sqrt{3a}\right)$ than find the area of triangle.**

    a) $4\sqrt{3}a^2 \ squnits$          b) $2\sqrt{3}a^2 \ squnits$

    c) $6\sqrt{3}a^2 \ squnits$          d) $8\sqrt{3}a^2 \ squnits$

16. The co-ordinates of the mid-point of the line joining the points (3p, 4) and (–2, 2q) are (5, p). Find the value of the p and q.

    a) 2,3          b) 2,4              c) 2,5              d) 4,2

17. The point (0, –2) lies on

    a) +ve X-axis                       b) +ve Y- axis

    c) –ve X-axis                       d) –ve Y-axis

18. If the value of mode and mean is 60 and 66 respectively, then find the value of median .

    a) 24          b) 94              c) 54              d) 64

19. If the mean of the numbers 27 + x, 89 + x,   107 + x, 156 + x is 82, then the mean of 130+x,

    126+x, 68+x, 50+x, 1+x is -

    a) 75          b) 157             c) 82              d) 80

20. In a class of 100 students there are 70 boys whose average marks in a subject are 75. If the average marks of the complete class are 72, then the average marks of  the girls is –

    a) 73          b) 65              c) 68              d) 74

21. Find the value of k from the following data if mean of the given data is 16.

| x | 5 | 10 | 15 | 20 | 25 |
|---|---|----|----|----|----|
| f | 2 | 8  | k  | 10 | 5  |

    a) 10          b) 15              c) 20              d) 25

**22.** If $\bar{x}$ is the mean of $x_1, x_2, ....x_n$ then for $a \neq 0$ , the mean of

$ax_1, ax_2, ....ax_n, \dfrac{x_1}{a}, \dfrac{x_2}{a}, ......, \dfrac{x_n}{a}$ **is**

a) $\left( a + \dfrac{1}{a} \right) \bar{x}$

b) $\left( a + \dfrac{1}{a} \right) \dfrac{\bar{x}}{2}$

c) $\left( a + \dfrac{1}{a} \right) \dfrac{\bar{x}}{n}$

d) $\dfrac{\left( a + \dfrac{1}{a} \right) \bar{x}}{2n}$

**23.** Find the area of a triangle, length of whose sides are 3cm, 4cm, and 5cm.

a) 2 cm²      b) 4 cm²      c) 6 cm²      d) 8 cm²

**24.** Mean of 20 observations is 15.5 Later it was found that the observation 24 was misred as 42. The corrected mean is :

a) 14.2                 b) 14.8

c) 14.0                 d) 14.6

**25.** The diameter of a garden roller is 1.4 m and it is 2 m long. How much area will it cover in 5 revolutions =

a) 44 m²      b) 54 m²      c) 74 m²      d) 84 m²

**26.** The length of diagonal of a square whose area is 16,900 m² is :

a) 130 m            b) 130 $\sqrt{2}$ m

c) 169 m            d) 144 m

**27.** Find the volume of a right circular cylinder, if the radius (r) of its base and height (h) are 7 cm and 15 cm respectively

a) 2130 cm³        b) 2310 cm³

c) 2220 cm²        d) 4220 cm³

**28.** The volume of a cone is 18480 cm³. If the height of the cone is 40 cm. Find the radius of its base.

a) 21 cm      b) 28 cm      c) 35 cm      d) 42 cm

**29.** Find the volume of a sphere whose surface area is 154 square cm.

a) 197.66 cm³                b) 187.66 cm³

c) 179.66 cm³                d) 177.66 cm³

**30.** If the radius of a circle is $\dfrac{7}{\sqrt{\pi}}$ cm,t hen the area of the circle is:

a) 154 cm²                b) $\dfrac{49}{\pi}$ cm²

c) 22 cm²ᴵ                d)  49 cm²

**31.** A cylindrical pillar is 50 cm in diametere and 3.5 m in height. Find the cost of painting the curved surface of the pillar at the rate of Rs. 12.50 per m².

a) Rs. 65.75                b) Rs. 68.75

c) Rs. 70.75                d) Rs. 56.75

**32.** The total surface area of a cube is 486 cm². Find its volume.

a) 715 cm³                b) 725 cm³

c) 700 cm³                d) 729 cm³

**33.** A quadrilateral *ABCD* is inscribed in a circle such that *AB* is a diameter and $\angle ADC = 130^0$

Find $\angle BAC.$

a)  60⁰        b) 50⁰        c)  40⁰        d) 20⁰

**34.** The region between a chord and either of the arcs is called

a) an arc                b) a sector

c) a segment                d) a semicircle

**35.** If P is a point in the interior of a circle with centre O and radius r, then

a) OP = r                b) OP > r

c) $OP \geq r$                d) OP < r

**36.** **When two circles intersect at points A and B with AC and AD being the diameters of the first and second circle then the points B,C and D are**

   a) concurrent                      b) circumcentre

   c) orthocentre                     d) collinear

**37.** **If PQ is a chord of a circle with radius $r$ units and $R$ is a point on the circle such that $\angle PRQ = 90^0$ , then the length of PQ is**
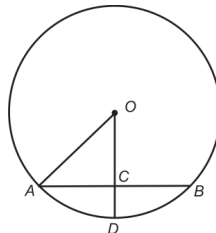
   a)  r units         b)  2r units         c) $\dfrac{r}{2}$ units         d)  4r units

**38.** **In the following figure, chords *AB* and *CD* of a circle when produced meet at P. If $\angle APD = 35^0$ and $\angle BCD = 25^0$ then $\angle ADC$ is equal to_____**
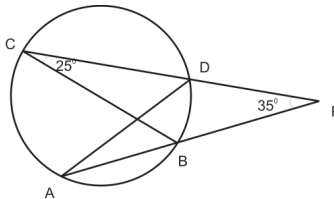


   a) $60^0$             b) $70^0$             c) $50^0$             d) $120^0$

**39.** **In the given figure, if *OA* = 5 cm, *AB* = 8 cm AND *OD* is perpendicular to *AB*, then *CD* is equal to _____**



   a) 2 cm         b) 3 cm         c) 4 cm         d) 5 cm

**40.** **In the given figure if AOB is a diameter of the circle and AC = BC, then** $\angle CAB$ **is equal to**



a) $30^0$          b) $60^0$          c) $90^0$          d) $45^0$
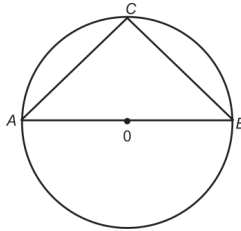
**41.** **In the given figure,** $AB \parallel CD \, and \, \angle ABC = 30^0, \angle ODC = 70^0$ **find x.**
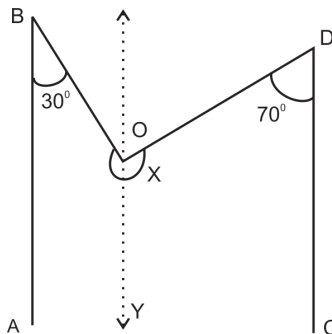


a) $260^0$          b) $360^0$          c) $280^0$          d) $320^0$

**42.** **In figure,** $\angle DBA = 132^0 \, and \, \angle EAC = 120^0.$ **Then which one is correct of the following.**



a) AB = AC                    b) AB > AC

c) AB < AC                    d) AC > AB

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**43.** In a $\triangle ABC \angle A = 45^0, \angle B = 70^0$. **Then the shortest and the largest sides of the triangle are**

a) AB, BC

b) BC, AC

c) AB, AC

d) None

**44. In the fig. given below find $\angle Z$ .**



a) $40^0$

b) $110^0$

c) $45^0$

d) None

**45. The correct statement out of the following is**



a) $\triangle ABC \sim \triangle FDE$

b) $\triangle ABC \sim \triangle DEF$

c) $\triangle ABC \sim \triangle FED$

d) $\triangle ABC \sim \triangle DFE$

**46. In the given figure AD, BE and CF are medians and G is the centroid of $\triangle ABC$. if ar $\triangle ABC = 132$ sq. units then ar. $\triangle DGE = .....$**



a) 11 sq. units

b) 44 sq. units

c) 22 sq. units

d) None of the above

**47. Each angle of an equilateral triangle is**

a) $60^0$          b) $45^0$          c) $90^0$          d) $30^0$

48. If $CD \parallel AB$, Then y is equal to
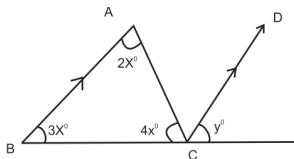


a) $100^0$          b) $40^0$          c) $60^0$          d) $80^0$

**49. If angles P,Q, R and S of the quadrilateral PQRS, taken in order, are in the ratio 3 : 7 : 6 : 4 then PQRS is a**

a) rhombus                    b) parallelogram

c) trapezium                  d) kite

**50. In the given figure AO and DO are the bisectors of the $\angle A$ and the $\angle D$ of the quadrilateral ABCD. Then the $\angle AOD$ is ___**



a) $67.5^0$                         b) $77.5^0$

c) $87.5^0$                         d) $99.75^0$
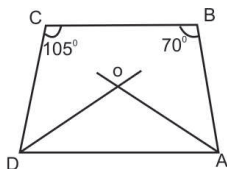
**51. If** $\dfrac{3+\sqrt{5}}{4-2\sqrt{5}} = p+q\sqrt{5}$ **. where *p* and *q* are rational numbers, find the values of *p* and *q*.**

a) −11/2,−5/2                    b) −7/2,−3/2

c) −3/2,-9/2                      d) -11/2,−9/2

**52.** **In figure ABCD is a parallelogram,**

$AE \perp DC$ and $CF \perp AD.$ **If AB = 16 cm,**

**AE = 8 cm and CF = 10 cm find AD.**
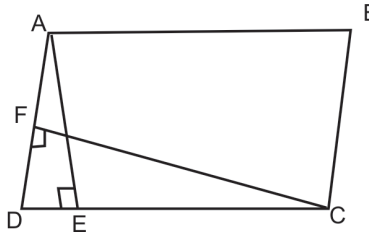


a) 5.10 cm                        b) 8.8 cm

c) 10.2 cm                      d) 12.8 cm

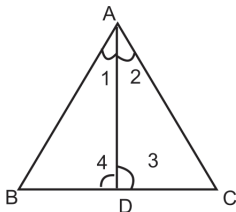**53.** **If in the given figure** $CE \parallel DB$ **, then the value of x is**



a) $75^0$         b) $30^0$         c) $85^0$         d) $45^0$
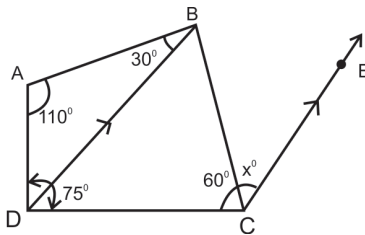
**54.** **Supplement angle of**



a) $122.7^0$                     b) $131.7^0$

c) $132.7^0$                     d) $132.4^0$
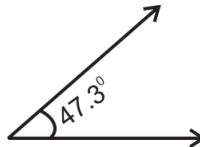
**55.** In the figure, AD is the bisector of $\angle A$ of $\triangle ABC$ then



a) AB > BD     b) AB = BD     c) AB < BD     d) none

**56.** The number $(6+\sqrt{2})\ (6-\sqrt{2})$ is

a) rational     b) irrational     c) can't say     d) none

**57.** In the figure, $\angle a = 115^0$ . Then $\angle g =$
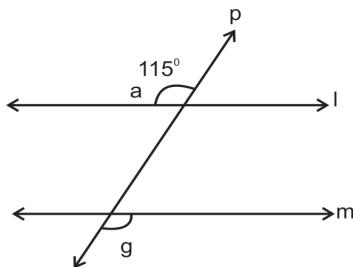


a) $65^0$     b) $75^0$     c) $115^0$     d) $120^0$

**58.** In the given figure $PQ \parallel RS\ \angle PAB = 70^0, \angle ACS = 110^0$ **Then**

$\angle BAC$ **is**
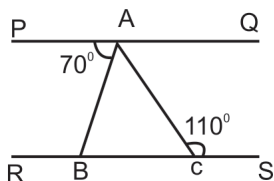


a) $40^0$     b) $70^0$     c) $110^0$     d) $30^0$

**59. From the adjoining figure x = 30⁰. The value of y⁰ is**



$2x^0$   $5y^0$

a) $25^0$        b) $24^0$        c) $36^0$        d) $45^0$
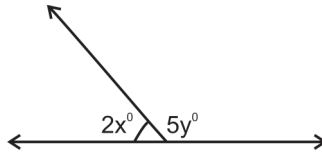
**60. Find $\alpha$ and $\beta$ if x + 1 and x+2 are factors of p(x) = $x^3 + 3x^2$ − 2$\alpha$x + $\beta$**

a) −1; 2      b) −1; 0      c) −2; −3      d) None

**61. Solve : 0.645 × 0.645 + 2 × 0.645 × 0.355 + 0.355 × 0.355**

a) 4        b) 3        c) 2        d) 1

**62. Factors of $x^2 - 7x + 12$ are**

a) (x–3)(x + 4)          b) (x –3) (x – 4)

c) (x+3) (x – 4)         d) (x +3) (x + 4)

**63. If $x^2 - x - 42 = (x+k)(x+6)$ then the value of k is**

a) 6        b) –6        c) 7        d) –7

**64. Factorize : $x^6 - 7x^3 - 8$**

a) $(x^3 +8) (x^3 -1)$        b) $(x^3 - 8)(x^3 -1)$

c) $(x^3 - 8)(x^3 +1)$        d) None

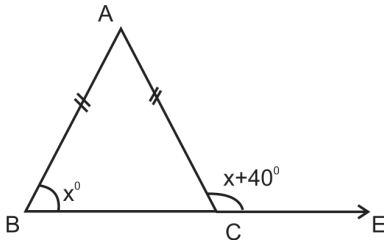**65. If $(x^2 + 3x + 5) (x^2 - 3x + 5) = m^2 - n^2$ then**

m = _____

a) $x^2 - 3x$     b) 3x     c) $x^2 + 5$     d) none

**66. The value of $50^3 - 20^3 - 30^3$ is**

a) 90000          b) 270000

c) 30000          d) None of the above

**67. If** $x + \dfrac{1}{x} = 4$ **then the value of** $x^3 + \dfrac{1}{x^3}$ **is**

a) 64

b) 76

c) 52

d) None of the above

**68. If (x + 2)(x − 5)(x − 6)(x + 1) = 144, then x =......**

a) −2, 7, −3

b) 2, −3, 7

c) 2, −7, 3

d) None of the above

**69. If $7^{1+x} + 7^{1-x} = 50$, then x = .....**

a) $\pm 2$

b) $\pm 3$

c) $\pm 1$

d) $\pm 4$

**70. What must be subtracted from** $\dfrac{7x}{x^2 + x - 12}$ **to get** $\dfrac{4}{x+4}$ **?**

a) $\dfrac{4}{x-3}$

b) $\dfrac{3}{x+3}$

c) $\dfrac{3}{x-3}$

d) None of the above

**71. In a** $\triangle ABC, if\ \angle A = \angle B + \angle C$ **then** $\angle A$ **=_____**

a) $60^0$

b) $45^0$

c) $90^0$

d) none

**72. If the two legs of a right angled** $\triangle$ **le are equal and the square of the hypotenuse is 100 then the length of each leg is**

a) 10

b) $5\sqrt{2}$

c) $10\sqrt{2}$

d) none

**73. In the following figure if AB = AC then find $\angle x$.**



a) $80^0$                              b) $70^0$

c) $60^0$                              d) $110^0$

**74. If two angles in a $\triangle$ le are $65^0$ and $85^0$, then the third angle is**

a) $30^0$                              b) $45^0$

c) $60^0$                              d) $90^0$

**75. In a $\triangle$ ABC If $AB^2 = BC^2 + AC^2$, then the right angle is at**

a) A                                   b) B

c) C                                   d) none

## KEY TO MODEL PAPER - I

| | | | | | |
|---|---|---|---|---|---|
| 1. b | 2. a | 3. c | 4. c | 5. b | 6. b |
| 7. c | 8. c | 9. c | 10. c | 11. b | 12. d |
| 13. d | 14. c | 15. b | 16. d | 17. d | 18. d |
| 19. a | 20. b | 21. b | 22. b | 23. c | 24. d |
| 25. a | 26. b | 27. b | 28. a | 29. c | 30. d |
| 31. b | 32. d | 33. c | 34. c | 35. d | 36. d |
| 37. b | 38. a | 39. a | 40. d | 41. a | 42. b |
| 43. b | 44. c | 45. c | 46. a | 47. a | 48. c |
| 49. c | 50. c | 51. a | 52. d | 53. c | 54. c |
| 55. a | 56. a | 57. c | 58. a | 59. b | 60. b |
| 61. d | 62. c | 63. d | 64. c | 65. c | 66. a |
| 67. c | 68. d | 69. c | 70. a | 71. c | 72. b |
| 73. b | 74. a | 75. c | | | |

# ADVANCED MATHS TEST-II

**Max. Marks : 60**                                    **Duration : 60 Mins.**

**General Instructions :**

1. Please find the separate Answer Sheets along with the question paper.

2. Mention your Test Code, Student ID, Name, Class, Section, Contact no. and School Name on the Answer Sheet as per Question Paper and Hall Ticket.

3. This question paper contains VI sections, duration is 60 minutes.

4. Please read the instructions carefully before attempting the question.

5. Answer questions in Answer Sheet only.

6. Don't write or tick anything on the question paper.

7. Use only Black or Blue Ball Point Pen to answer the question in Answer Sheet.

8. Submit only answer sheet(s) to the invigilator.

## SECTION - I        10 × 1 = 10

**DIRECTIONS : ( 1 - 10) -** Complete the following statements with an appropriate word/term to be written in the answer sheet.

1. Value of a is _____ if $\dfrac{\sqrt{3}-1}{\sqrt{3}+1} = a + b\sqrt{3}$

2. The co-ordinates of the mid - point of the line segement joining two points $P(x_1,y_1,z_1)$ & $Q(x_2,y_2,z_2)$ are ( _____ )

3. The median of a set of 9 distinct observations is 20.5. If each of the largest 4 observation of the set is increased by 2, then the median of the new set_____.

4.  The side of equilateral triangle is 'a' units then the area of triangle is _____ sq.units.

5.  In the given figure, ABC is an isosceles triangle in which AB = AC and $\angle ABC = 50^0$, then $\angle BDC$ _____.
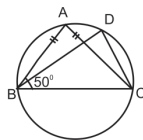
6.  In figure, sides QP and RQ of $\triangle PQR$ are produced to points S and T respectively. If $\angle SPR = 135^0$ and $\angle PQT = 110^0$, then $\angle PRQ$ ____
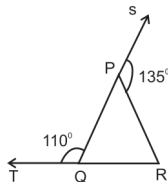
7.  The figure formed by joining the mid-points of the consecutive sides of a quadrilateral is ____

8.  If $l$ and $m$ are intersecting lines, $l \parallel p$ and $m \parallel q$, then p and q are _____.

9.  $\frac{4}{9}a^2 + b^2 + \frac{4}{3}ab$ factorise _____.

10. In a $\triangle PQR$, PQ = PR and $\angle Q$ is twice that of $\angle P$ . then $\angle Q =$ ____.

## SECTION - II                    10 × 1 = 10

**DIRECTIONS: (11 - 20) -** Read the following statements and write true or false with reasons or solutions; in the answer sheet.

11. $\frac{\sqrt{7}}{3\sqrt{3}}$, in rational denominator is 3.

12. The distance between the two points A(x,5) and B(0,-3) is $4\sqrt{5}$ unit then x = $\pm 4$

13. 50,70,50,70,80,70,70,80,70,50 the observations median is 50.

14. Ratio of volumes of two cylinders with equal radii are H : h

15.  Angle in a semi circle is a right angle.

16. If a, b and c are the sides of a $\triangle le$, then b > c + a is

17. ABCD is a rhombus, If $\angle ACB = 40^0$ then $\angle ADB$ is also 40⁰

18. A line which intersects two or more lines at different points is called intersecting lines.

19. When $x^{11} + 1$ is divided by x + 1 then the remainder is 11, since x is odd.

20. In a $\triangle ABC$, If $\angle B$ an obtuse angle, then the longest side is AC

### SECTION - III                   10 × 1 = 10

**DIRECTIONS: ( 21 - 30 ) -** Each question contains statements given in two columns which have to be matched. Match the statements (21,22,...30) in column I  with statements (A,B,...T) in column II . Arrange the matched statements in order and write in the answer sheet.

| **Column - I** | **Column - II** |
|---|---|
| 21) $\dfrac{-3}{17}$ is a | A)  90⁰, 60⁰ |
| 22) If the point (x,y ) is equidistant from the points (a+b, b - a) and (a– b, a + b) then the equation is. | B) 45⁰ |
| 23) If 6, 4,8, and 3 occur with frequencies 4,2,5  and 1 respectively, then the arithmetic mean is | C) $\angle A + \angle B$ |
| 24) The ratio of  the volume and surface area of a sphere of unit radius | D) $4x^3 - 5x^2 + 2\sqrt{3}$ |
| 25) Distance of a chord AB of a circle from the centre is 12 cm and length of the chord is 10 cm. The diameter of the circle is ___ cm. | E) 126⁰ |
| (26) In a $\triangle ABC$ If $2\angle A = 3\angle B = 6\angle C$ then $\angle A, \angle B, \angle C$ are _____. | F)  fraction |

27) ABCD is a parallelogram in which
$\angle DAB = 75^0$ and $\angle DBC = 60^0$
then $\angle CDB =$ _____

G) ax = by

28) In triangle ABC .
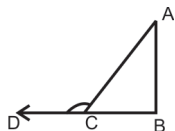


the exterior angle $\angle ACD =$ _____.

H) 6.25

29) Divide $12x^4 - 15x^3 + 6\sqrt{3x}$ by 3x

I)    1 : 2

30) If the angles of a $\triangle le$ are in the ratio
1 : 2 : 7 then the obtuse angle is

J)    26 cm

K)    $30^0$, $60^0$, $90^0$

L)    $25^0$

M)    $\angle A + \angle C$

N)    $4x^3 + 5x^2 - \sqrt{3}$

O)    $136^0$

P)    Rational number

Q)    ay = bx

R)    6.75

S)    1 : 3

T)    16 cm

## SECTION - IV                    10 × 1 = 10

**Directions : (31 - 40) -** Identify the correct answer from the given options and write in the answer sheet.

31. Express 0.2434343 _____ then $\dfrac{p}{q} =$

a) $\dfrac{241}{990}$    b) $\dfrac{241}{900}$    c) $\dfrac{241}{1000}$    d) $\dfrac{241}{100}$

32. The line x + 1 = 0 is _____

    a) parallel to y - axis        b) parallel to x - axis

    c) passing through the origin    d) none of these

33. The mean of 11 observations is 17.5. If an observation 15 is deleted, the mean of the remaining observations is

    a) 16        b) 17.75        c) 17.5        d) 17.25

34. The sides of a triangular plot are in the ratio 3 : 5 : 7 and its perimeters is 300m. then if area is

    a) $1200\sqrt{3}m^2$        b) $1300\sqrt{3}m^2$

    c) $1400\sqrt{3}m^2$        d) $1500\sqrt{3}m^2$

35. An equilateral $\triangle le$ PQR is inscribed in a circle with centre O. Find $\angle QOR$ .

    a) $60^0$        b) $120^0$        c) $30^0$        d) None

36. In $\triangle ABC, AB = AC$ and AD is perpendicular to BC. State the property by which $\triangle ADB \cong \triangle ADC$ .

    a) SAS property        b) SSS property

    c) RHS property        d) ASA property

37. In a rhombus ABCD, $\angle A = 60^0$ and AB = 6 cm. then the diagonal BD is.

    a) $2\sqrt{3}\, cm$        b) 6 cm

    c) 12 cm        d) Insufficient data

38. Can 6 cm, 5 cm and 3 cm form a triangle?

    a) Yes        b) No

    c) Sometimes        d) None

39. If $x + \dfrac{1}{x} = a + b$ and $x - \dfrac{1}{x} = a - b$ then

    a) ab = 1        b) a = b        c) ab = 2        d) a + b = 0

40. A triangle always has

    a) exactly one acute angle        b) exactly two acute angles

    c) at least two acute angles        d) none of these

**SECTION - V**          **10 × 1 = 10**

**DIRECTIONS: (41 - 50) - Choose the correct answers (More than one correct answer) from the given options and write in the answer sheet.**

41. Which of the following is equal to x?

    a) $x^{\frac{12}{7}} - x^{\frac{5}{7}}$

    b) $\sqrt[12]{\left(x^4\right)^{\frac{1}{3}}}$

    c) $\left(\sqrt{x^3}\right)^{\frac{2}{3}}$

    d) $x^{12/19} \times x^{7/19}$

42. Which of the following given vertices of a triangle has its centroid as O (2,3)?

    a) A(1,3), B(2,4) C(3,2)        b) P(0,3), Q(2,4), R(3,2)

    c) X(0,2), (2,1), Z(4,6)        d) none of these

43. Which of the following is/are measure of central tendency?

    a) mean        b) median        c) Variance        d) mode

44. The volume of the two spheres are in the ratio 64: 27. The difference of their surface areas, if the sum of their radii is 7, is

    a) 28 π cm²        b) 88 cm²

    c) 64 πcm²        d) 36 πcm²

45. Two circles are drawn with sides PQ and PR of a triangle PQR as diameters, Circles intersect at a point S. Then

  a) $\angle PSQ$ and $\angle PSR$ form a linear pair angles.

  b) $\angle PSQ$ and $\angle PSR$ are complementary angles.

  c) $\angle PSQ$ and $\angle PSR$ are supplementary angles.

  d) points Q,S, R are collinear points.

46. Which of the following is/are correct?

  a) If two sides of a triangle are unequal, the larger side has the greater angle opposite to it

  b) The sum of any two sides of a triangle is greater than its third side.

  c) If all the line segments that can be drawn to a given line from an external point, the perpendicular line segment is the shortest.

  d) If all the three sides of a triangle are equal, it is called a scalene triangle.

47. Choose the correct statements among the following given options.

  a) Area of a parallelogram is the product of any of its sides and the corresponding altitude.

  b) The area of a triangle is half the product of any of its sides and the corresponding altitude.

  c) The area of a trapezium is half the product of its height and the sum of the parallel sides.

  d) A diagonal of a parallelogram divides it into two triangles of distinct areas.

48. Which of the following is/are Euclid's postulates?

  a) A straight line may be drawn from any one point to any other point.

  b) A circle can be drawn with any centre and any radius.

  c) A terminated line cannot be produced indefinitely.

  d) All right angles are never equal to one another.

49. Which of the following is/are not false?

   a) Highest power of the variable in a polynomial is the degree of polynomial.

   b) Degree of zero polynomial is always defined.

   c) A polynomial of degree one is called a linear polynomial.

   d) A polynomial of degree two is called a constant polynomial.

50. Two chimneys 18 m and 13 m high stand upright in a ground. If their feet are 12 m apart, then the distance between their tops is

   a) 5 m                          b) 31 m

   c) 13 m                         d) 18 m

## SECTION - VI               10 × 1 = 10

**Assertion & Reason**

**DIRECTIONS : (51- 60)** - Each of these questions contains an Assertion followed by reason. Read them carefully and answer the question on the basis of following options. You have to select the one that best describes the two statements and write in the answer sheet.

a)  If both **Assertion** and **Reason** are **correct** and Reason is the **Correct explanation** of Assertion.

b)  If both **Assertion** and **Reason** are correct, but Reason is **not the correct explanation** of Assertion.

c)  If **Assertion** is **correct** but **Reason** is **incorrect.**

d)  If **Assertion** is **incorrect** but **Reason** is **correct.**

51. **Assertion:** A rational number between $\frac{1}{3} \, and \, \frac{1}{2} \, is \, \frac{5}{12}$.

   **Reason:** Rational number between two numbers a and b is $\sqrt{ab}$

52. **Assertion:** The ratio in which the segment joining the points( -3, 10) and (0, –8) is divided by (– 1, 6) is 2 : 7.

    **Reason:** If A ( $x_1$, $y_1$), B($x_2$,$y_2$) are two points. Then the point C( x,y) such that C divides AB internally in the ratio K : 1 is given by $x = \dfrac{Kx_2 + x_1}{K+1}, y = \dfrac{Ky_2 + y_1}{K+1}$

53. **Assertion:** Mode of the given data 110, 120, 130, 120, 110,140, 130, 120, 140, 120, is120

    **Reason:** The observation that occurs most frequenctly, i.e., the observation with maximum freequency is called mode.

54. **Assertion:** The total surface area of a cone whose radius is $\dfrac{r}{2}$ and slant height 2$l$ is $(\pi)r\left(l + \dfrac{r}{4}\right)$.

    **Reason:** Total surface area of cone is $\pi r(l + r)$ where r is radius and $l$ is the slant height of the cone.

55. **Assertion:** If P and Q are any two points on a circle, then the line segment PQ is called a chord of the circle.

    **Reason:** Equal chords of a circle subtend equal angles at the centre.

56. **Assertion:** If $ABC \cong PQR$ and area $(\triangle ABC) = 10sq.$ units, then area $(\triangle PQR) = 20sq.$ units.

    **Reason:** Two congruent figures have equal areas.

57. **Assertion:** If the diagonal of a parallelogram ABCD are equal, then $\angle ABC = 90^0$.

    **Reason:** If the diagonals of a parallelogram are equal, it becomes a rectangle.

58. **Assertion:** If two internal opposite angles of a triangle are equal and external angle is given to be $110^0$

,then each of the equal internal angle is $55^0$.

**Reason:** A triangle with one of its angle $90^0$, is called a right angle triangle

59. **Assertion:** If $f(x) = x^4 + x^3 - 2x^2 + x + 1$ is divided by $(x-1)$, then its remainder is 2.

**Reason:** If $p(x)$ be a polynomial of degree greater than or equal to one, divided by the linear polynomial x– a, then the remainder is p(–a).

60. **Assertion:** All the points (1,0), ( -1, 0), (2, 0) and (5, 0) lie on the x - axis.

**Reason:** Equation of the x-axis is y = 0

# SOLUTIONS TO MODEL PAPER - II

## SECTION - I
### Fill in the Blanks

1) 2

2) $\left( \dfrac{x_1 + x_2}{2}, \dfrac{y_1 + y_2}{2}, \dfrac{z_1 + z_2}{2} \right)$

3) 20.5

4) $\dfrac{\sqrt{3a^2}}{4}$

5) $80^0$

6) $65^0$

7) parallogram

8) intersecting

9) $\left( \dfrac{2a}{3} + b \right)\left( \dfrac{2a}{3} + b \right)$

10) $72^0$

## SECTION - II
### True / False

11) False

12) True

13) False

14) True

15) True

16) False

17) False

18) False

19) False

20) True

## SECTION - III
### Match  the Following

21) $\rightarrow$ p

22) $\rightarrow$ Q

23) $\rightarrow$ H

24) $\rightarrow$ S

25) $\rightarrow$ J

26) $\rightarrow$ A

27) $\rightarrow$ B

28) $\rightarrow$ C

29) $\rightarrow$ D

30) $\rightarrow$ E

## SECTION - IV

### Multiple Choice Questions

31) a      32) a      33) b      34) d

35) b      36) c      37) b      38) a

39) a      40) c

## SECTION - V

### More than one correct answers

41) c, d      42) a, c      43) a, b, d      44) a, b

45) a, c, d      46) a, b, c      47) a, b, c      48) a, b

49) a, c      50) c

## SECTION - VI

### Assertion & Reason

51.    c) If **Assertion** is **correct** but **Reason** is **incorrect.**

52.    a) If both **Assertion** and **Reason** are **correct** and Reason is the **Correct explanation** of Assertion.

53.    a) If both **Assertion** and **Reason** are **correct** and Reason is the **Correct explanation** of Assertion.

54.    a) If both **Assertion** and **Reason** are **correct** and Reason is the **Correct explanation** of Assertion.

55.    a) If both **Assertion** and **Reason** are **correct** and Reason is the **Correct explanation** of Assertion.

56.    d) If **Assertion** is **incorrect** but **Reason** is **correct.**

57.    a) If both **Assertion** and **Reason** are **correct** and Reason is the **Correct explanation** of Assertion.

58.    b) If both **Assertion** and **Reason** are correct, but Reason is **not the correct explanation** of Assertion.

59.    c) If **Assertion** is **correct** but **Reason** is **incorrect.**

60.    a) If both **Assertion** and **Reason** are **correct** and Reason is the **Correct explanation** of Assertion.