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Unit 1: Arithmetic Progression

I. Multiple choice questions.

1) The n^{th} term of an A.P whose first term 'a' and common difference 'd' is

A) a+(n+1) d B) a+(n−1)d C) a−(n+1)d D) a−(n−1)d

2) Which of the following list of numbers is an A.P?

A) 1,3,6,8---- B) 1,4,9---- C) 2,4,8,16---- D) 1,3,5,7----

3) The common difference of the A.P 2, 0,−2,−4,----

A) 0 B) 2 C) −2 D) −4

4) The sum of first 'n' natural numbers of an A.P is

A) $\frac{n(n+1)}{2}$ B) $\frac{n(n-1)}{2}$ C) n^2 D) n(n+1)

5) The value of 'x' if 7, x, 23 are in A.P is

A) 30 B) 18 C) 15 D) 9

6) If the nth term of an A.P is a_n= 8−3n, then its common difference is

A) −5 B) −3 C) 3 D) 5

7) The 13^{th} term of an A.P whose first term and common difference respectively are $\frac{3}{2}$ and $\frac{2}{3}$ is

A) $\frac{6}{5}$ B) $\frac{11}{2}$ C) $\frac{17}{2}$ D) $\frac{19}{2}$

8) The result obtained on making half the sum of 7^{th} and 9^{th} term of an A.P is

A) 6^{th} term B) 8^{th} term C) 10^{th} term D) common difference

9) In an A.P the first term is 'm' and common difference is 2m then its 5^{th} term is

A) 5m B) 8m C) 9m D) 10m

10) In an A.P first term is 'a' and common difference is'd' the correct relation in the following is

A) $a_6 = a_4 + 4d$ B) $a_8 = a_5 + 3d$ C) $a_{10} = a_3 + 4d$ D) $a_5 = a_3 + d$

II. One mark questions.

1) In an A.P if $S_{10} = 35$ and $S_9 = 28$ find a_{10}.

2) Find the sum of first 25 odd natural numbers.

3) Find the common difference of the A.P 1,−1,−3,−5 -----

4) Write the formula used to find the sum of first 'n' terms of the A.P whose first term 'a' and common difference 'd'.

5) Find the 20^{th} term of the A.P 12, 7, 2----

6) In an A.P first term is 'K' and common difference is 'm'. Find its $(n-3)^{rd}$ terms.

7) The interior angles of a triangle are in A.P in which the first term and common differences are equal. Find the measure of bigger angle if the smaller one is 30^{o}.

8) In an A.P the first term is -8 and the last term is 100. Find the sum of its first 20 terms.

9) Find the sum of first 10 terms of an A.P in which the half of the sum of first and last term is 80.

10) Write give an example for an A.P in which the sum of its terms is zero.

III. Two mark questions.

1) Which term of the A.P 3,8,13,18,------- is 78 .

2) How many two-digit numbers which are divided by 3.

3) Find the 20^{th} term from the last term of the A.P 3,8,13 ----253.

4) Find the sum of first 20 terms of the A.P 1,4,7 -----.

5) Find the sum of first 15 terms of the A.P having the n^{th} term is 3+4n.

6) Find the sum of first 15 positive integers are divisible by 6 (using formula)

7) The first term and last term of the A.P are 2 and 205 respectively. If there are 30 terms in an A.P. Find the common difference.

8) The angles of a triangle are in an A.P. The smallest angle is 30^{o}. Find all the angles of a triangle.

9) The sum of 20 terms of an A.P is 820. If the first term is 3. Find the common difference.

10) If 2x, x + 10, 3x + 2 are in an A.P. Find the value of x.

IV. Three mark questions.

1) Find the A.P whose third term is 16 and 7^{th} term exceeds the 5^{th} term by 12.

2) If 10 times the 10^{th} term of an A.P is equal to 15 times the 15^{th} term. Show that 25^{th} term of the A.P is zero.

3) How many terms of the A.P 1,4,7 ----- should be taken so that their sum is 51.

4) The first term of an A.P is 5, the last term is 45 and the sum is 400. Find the number of terms and common difference.

5) The sum of three terms of an A.P is 12 and their product is 48. Find the terms.

6) The interior angles of a quadrilateral are in an A.P. The smallest angle is 15°. Find the remaining angles.

7) In an A.P if $a_n = 5 - 2n$. Find the sum of first 30 terms.

V. 4 mark questions.

1) The third term of an A.P is 8 and the 9^{th} term of the A.P exceeds three times the third term by 2. Find the sum of its first 19 terms.

2) Find three numbers of the A.P whose sum is 24 and sum of their squares is 210.

3) Divide 32 into four parts which are in A.P such that the product of extremes to the product of means is 7:15. Find the four parts.

4) In an A.P whose first term is 2. The sum of first five terms is one fourth of the sum of the next five terms. Show that $a_{20} = -112$.

5) In an A.P, the sum of first term, third term and fifth term is 39 and the sum of second, fourth and sixth terms is 51. Find the 10^{th} term of the A.P.

VI. 5mark questions.

1) The sum of first 10 terms of the A.P is 175 and sum of next 10 terms is 475. Find the first term and common difference.

2) The sum of three terms of an A.P is 21 and the product of the first and third term exceeds the second term by 6. Find the sum of 20 terms of the A.P.

3) In an A.P the sum of first 9 terms is 14 more than 5 times the 8^{th} term, 8^{th} and 2^{nd} terms are in the ratio 11:2. Find the sum of first 20 terms of the A.P.

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Unit 2: Triangles

I. Multiple choice questions.

1) Sides of two similar triangles are in the ratio 4:9 then areas of these triangles are in the ratio.

A) 2 : 3 **B) 4 : 9** **C) 81 : 16** **D) 16 : 81**

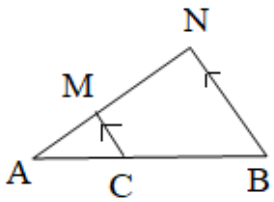
2) At a certain time of the day, a man 6 feet tall casts his shadow 8 feet long, then the length of the shadow cast by a building 45 feet high at the same time which is next to the man is

A) 60 feet **B) 45 feet** **C) 48 feet** **D) 90 feet**

3) In the adjoining figure Δ ABN ~ Δ AMC. The ratio of sides AM and AN is 2:5 then CM : BN is

A) 5 : 2 **B) 2 : 5**

C) 1 : 2 **D) 2 : 3**



4) The measures representing the sides of a right angled triangle are

A) 2,3,5 **B) 6,8,10** **C) 8,4,6** **D) 6,8,9**

II. One mark questions.

1) Write the statement of Basic proportionality theorem.

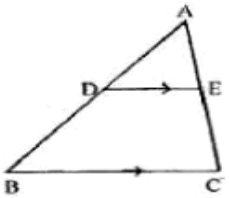
2) Write the statement of converse of Basic proportionality theorem.

3) Write the statement of Pythagoras theorem.

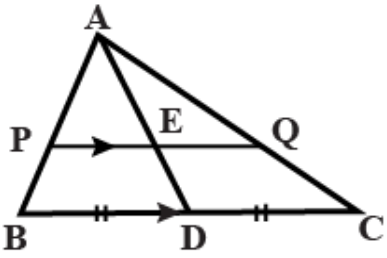
4) In a right angles triangle ABC, $\angle B = 90^{o}$, AC = 17 cm and AB = 8 cm find the length of BC.

III. 2 mark questions.

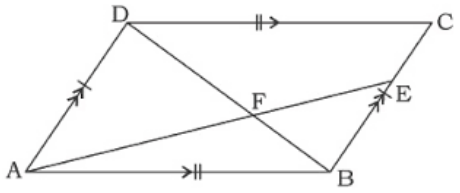
1) In the adjoining figure DE ‖ BC, BD = 7 cm, AD = 5c.m and AC = 18 cm, find AE and CE.



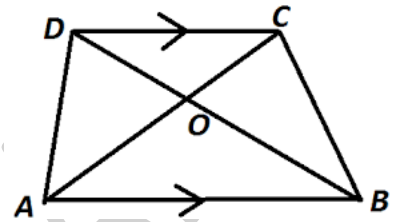
2) In ΔABC, PQ ‖BC and BD = DC prove that PE = EQ.



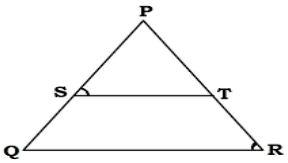
3) The diagonal BD of parallelogram ABCD intersects, AE at F. E is any point on BC. Prove that DF.EF = FB.FA.



4) In the trapezium ABCD, AB ||DC, AB = 2CD and area (Δ AOB) = 84 cm^2. Find the area of ΔCOD.

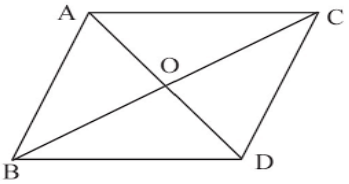


5) In the adjoining figure, $\frac{PS}{SQ} = \frac{PT}{TR}$ and ∠PST = ∠PRQ. Prove that PQR is an isosceles triangle.

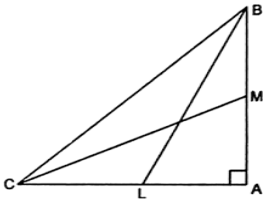


IV. 3 mark questions.

1) In the adjoining figure, ABC and DBC are two triangles on the same base BC. If AD intersect BC at O. Show that $\frac{area(\Delta ABC)}{area(\Delta DBC)} = \frac{AO}{DO}$



2) BL and CM are medians of a ΔABC right angled at A. Prove that 4 (BL^2 + CM^2) = 5BC^2



3) In an equilateral triangle, prove that three times the square of one side is equal to four times the square of one of its altitudes.

4) If the areas of two similar triangles are equal, then they are congruent prove.

V. 4 mark questions.

1) "In two triangles; corresponding angles are equal, then their corresponding sides are in the same ratio and hence the two triangles are similar" Prove this.

2) The ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides." Prove this.

VI. 5 mark questions.

1) State and prove "Basic proportionality theorem" (Thales theorem).

2) State and prove "Pythagoras theorem".

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Unit-3:- Pair of linear equations in two variables

I. Multiple choice questions.

1. If two equations have exactly one solution and are in the form $\frac{a1}{a2} \neq \frac{b1}{b2}$ then they are

a. Coincident lines **b. Intersecting lines** **c. Transversal lines** **d. Parallel lines**

2. If two equations have no solutions and are in the form $\frac{a1}{a2} = \frac{b1}{b2} \neq \frac{c1}{c2}$ then they are

a. Coincident lines **b. Intersecting lines** **c. Parallel lines** **d. All of the above**

3. In the general form of pair of linear equations $a_1x+b_1y+c1=0$ and $a_2x+b_2y+c_2=0$ where a_1, a_2, b_1, b2 and c_1, c_2 are

a. Whole numbers **b. Real numbers** **c. Integers** **d. Co-primes**

4. x+2y-4=0 and 2x+4y-12=0 then the lines are

a. Coincide **b. Parallel** **c. Intersect** **d. None of the above**

5. If the lines 3x+2ky-2=0and 2x+5y+1=0 are parallel then the value of k is

a. $^{4}/_{15}$ **b. $^{15}/_{4}$** **c. $^{4}/_{5}$** **d. $^{5}/_{4}$**

6. The solution of the equations x-y=2 and x+y=4 are

a. 3,1 **b. 4,3** **c. 5,1** **d. -1, -3**

II. One mark questions.

1. The coach of a cricket team buys 3 bats and 6 balls for Rs 3900. Later,she buys anotherbat and 2 more balls of the same kind for Rs 1300. Represent this situation algebraically.

2. Check whether the pair of equations$x + 3y = 6$ and $2x – 3y = 12$ is consistent.

III. Two mark questions.

1) On comparing the ratios $\frac{a1}{a2}, \frac{b1}{b2}$ and $\frac{c1}{c2}$, find out whether the lines representing the following pairs of linear equations intersect at a point, are parallel or coincident.

i) 5x – 4y + 8 = 0 and 7x + 6y – 9 = 0

ii)) 9x + 3y + 12 = 0 and 18x + 6y + 24 = 0

IV. Find the value of x and y by graphical method for the following equations.

1. x-y+1=0 and 3x+2y-12=0

2. x+y=3 and 3x-2y=4

3. x+3y=6 and 2x-3y=12

4. x+3y=6 and 2x-3y=12

5. 2x-y-4=0 and x+y+1=0

6. 2x+y=6 and 2x-y+2=0

7. x-y=1 and 2x+y=8

8. 2x-y-2=0 and 4x-3y-24=0

9. x+y=3 and 2x+5y=12

10. x+y=6 and x-y=6

V. For the pair of linear equations find their solution by substitution method, elimination method and cross multiplication method.

1. 3x-5y=-1 and x-y=-1

2. x+2y=-1 and 2x-3y=12

3. 2x+3y=9 and 3x+4y=5

4. x-y+1=0 and 3x+2y-12=0

5. x-y=1 and 2x+y=8

6. x+y=6 and x-y=6

7. x-y=1 and 2x+y=8

8. 2x+3y=9 and 3x+4y=5

9. 8x+5y=9 and 3x+2y=4

10. x+y=14 and x-y=4

VI. Solve the following by constructing linear equation.

1. The sum of a two-digit number and the number obtained by reversing the digits is 66. If the digits of the number differ by 2, find the number. How many such numbers are there?

2. Ritu can row downstream 20 km in 2 hours, and upstream 4 km in 2 hours. Find herspeed of rowing in still water and the speed of the current.

3. 2 women and 5 men can together finish an embroidery work in 4 days, while 3women and 6 men can finish it in 3 days. Find the time taken by 1 woman alone and also time taken by 1 man alone.

4. The coach of a cricket team buys 3 bats and 6 balls for Rs 3900. Later,he buys anotherbat and 2 more balls of the same kind for Rs 1300. Find the cost of each ball and bat separately.

5. The larger of two supplementary angles exceeds the smaller by 18 degrees. Findthem.

6. Five years ago, hari was thrice as old asramu. Ten years later hari will be twice asold asramu. How old arehari andramu.

EXTRA QUESTIONS

Solve the followinglinear equationsby suitable method.

1. $\sqrt{2}x+\sqrt{3}y=0$ **and** $\sqrt{3}x+\sqrt{8}y=0$

2. $0.4x+0.3y=1.7$ **and** $0.7x-0.2y=0.8$

3. $\frac{x}{7}+\frac{y}{3}=5$ **and** $\frac{x}{2}-\frac{y}{9}=6$

4. $0.2x+0.3y=1.3$ **and** $0.4x+0.5y=2.3$

5. $217x+131y=913$ **and** $131x+217y=827$

Solve the following by reducing them to linear equations.

1. $\frac{x+y}{xy}=2$ **and** $\frac{x-y}{xy}=6$

2. $\frac{2}{\sqrt{x}}+\frac{3}{\sqrt{y}}=2$ **and** $\frac{4}{\sqrt{x}}-\frac{9}{\sqrt{y}}=-1$

3. $\frac{22}{x+y}+\frac{15}{x-y}=5$ **and** $\frac{55}{x+y}+\frac{45}{x-y}=14$

4. $\frac{7x-2y}{xy}=5$ **and** $\frac{8x+7y}{xy}=15$

5. $6x+3y=6xy$ **and** $2x+4y=5xy$

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UNIT -4:- CIRCLES

I. Multiple choice questions.

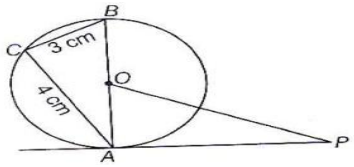
1. Maximum number of tangents drawn to a circle from an external point is
A. 2 B. 3 C. 4 D. 5
2. A straight which intersects a circle at two distinct points is
A. Tangent B. Chord C. Secant D. Diameter
3. The angle between a tangent to a circle and the radius through the point of contact is
A. 60° B. 90° C. 120° D. 180°
4. Number of tangents can be drawn at any point on a circle is
A. 1 B. 2 C. 3 D. Many
5. The lengths of tangents drawn from an external point to the circle are
A. Equal B. Not equal C. sometimes are equal D. none
6. Tangents drawn at extremities of the diameter of a circle are
A. Perpendicular B. parallel C. Equal D. Not equal
7. A line through point of contact and passing through the centre of circle is known as
A. Tangent B. Secant C. Chord D. Segment
8. If the angle between the two tangents to a circle is 40^0 , then the angle between the radii is
A. 90^0 B.100^0 C. 140^0 D.180^0
9. Distance between two parallel tangents of a circle of radius 3.5cm is
A.3.5cm B.7cm C.10cm D.14cm.

II. VSAQ (one mark questions).

1.Can the angle between two tangents to a circle may be 0^0. Justify.
2.How many tangents can a circle have?
3.What is called the intersecting point of a circle and a tangent?
4.How many parallel tangents at most a circle can have?
5.What is angle between a tangent of a circle and its radius?
6.What is the name of line intersecting a circle in two points?
7.What is the name of two circles having a common centre?
8.Give two examples of tangents of circle from day to day life ?
9.How many lines passes through a point on the circle ?
10.How many tangents can be drawn at the ends of diameter of a circle?

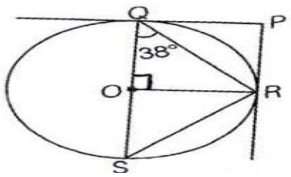
III. 2 marks questions.

1. ***PA*** **is a tangent to the circle with center*O*. If *BC* = 3 cm, *AC* = 4 cm, and $\Delta ACB \sim \Delta PAO$ then find *OA* and $\frac{OP}{AP}$**

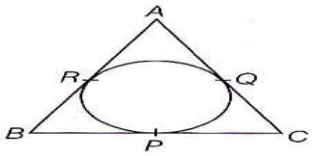


2. **The length of common chord of two intersecting circles is 30 cm. If the diameters of these two circles are 50 cm and 34 cm, then calculate the distance between their centers.**

3.PQand PRare tangents at *Q* and *R*, respectively. If ∠*SQR* = 38°, then find ∠QPR, ∠PRQ, ∠QSR and ∠PQR

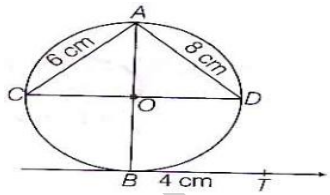


4. In the adjoining figure, an isosceles Δ*ABC* with *AB* = *AC*, circumscribes a circle. Prove that point of contact *P* bisects the base *BC*.



5.Prove that in two concentric circles, the chord of the larger circle, which touches the smaller circle, is bisected at the point of contact.

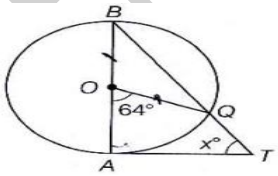
6.In the adjoining figure, *AD* = 8 cm, *AC* = 6 cm and *TB* is the tangent at *B* to the circle with Centre*O*. Find *OT*, if *BT* is 4 cm.



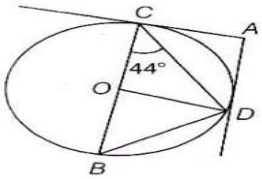
7.In two concentric circles, a chord of the larger circle touches the smaller circle. If the length of this chord is 8 cm and the diameter of the smaller circle is 6 cm, then find the diameter of the larger circle.

IV. 3 Mark questions.

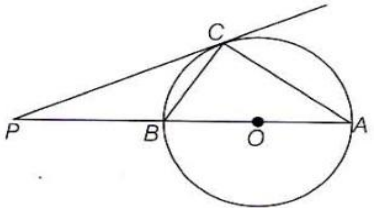
1. **In the given figure, *AB* is a diameter of the circle with center*O* and*AT*is a tangent. Calculate the numerical value of *x*.**



2. **Two tangents *PA* and *PB* are drawn to the circle with centre *O*, such that ∠*APB* = 120°. Prove that *OP* = 2*AP*.**
3. ***AC* and *AD* are tangents at *C* and *D*, respectively. If ∠*BCD*= 44°, then find ∠*CAD*, ∠*ADC*, ∠*CBD* and∠*ACD*.**

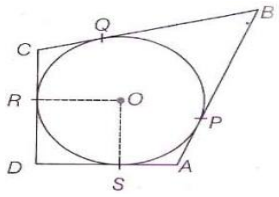


4. ***PC* is an tangent to the circle at *C*. *AOB* is the diameter which when extended meets the tangent at P. Find ∠*CBA*, ∠*AOC* and ∠*BCO*, if∠*PCA* = 110°**

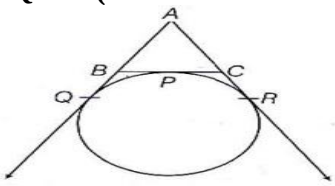


5.

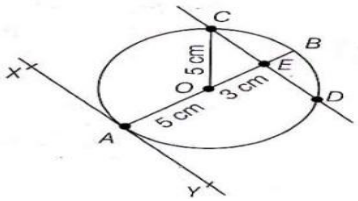
6. **In the given figure, $\angle ADC = 90°$, $BC = 38$ cm, $CD = 28$ cm and $BP = 25$ cm, then the radius of the circle.**



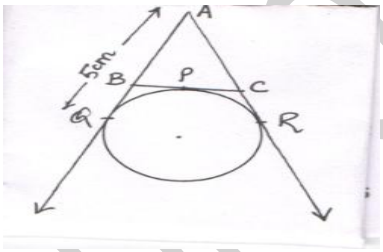
7. **A circle touches the side BC of aΔABC at P and AB and AC when produced at Q and R respectively as shown in the figure. Show that $AQ = ½$ (Perimeter of ΔABC)**



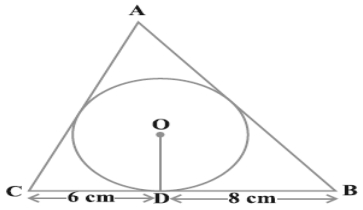
8. **A circle touches all the four sides of a quadrilateral ABCD. Prove that AB+CD = BC+DA**
9. **Prove that the angle between two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the center.**
10. **At one end A of a diameter AB of a circle of radius 5 cm, tangent XAY is drawn to the circle.Find thelength of the chord CD parallel to XY and at a distance 8 cm from A**



11. **In the given figure, a circle touches the side BC of ∆ABC at P and touches AB and AC produced at Q and R respectively. If AQ = 5cm, find the perimeter of ∆ABC.**



12. **A triangle ABC is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC into which BC is divided by the point of contact D are of lengths 8 cm and 6 cm respectively . Find the sides AB and AC.**



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UNIT -5:- Constructions

I. Two marks questions.

1. Draw a line segment of length 8.6 cm and divide it in the ratio 4:7 and measure the parts.

2. Draw a line segment of length 9.4 cm and divide it in the ratio 3:5:6.

3. Draw a circle of radius 3 cm and construct a tangent at a point 'P' on the circle.

4. Draw a circle of radius 3 cm, construct a tangent which is 7 cm away from the centre of the circle. Measure the length of the tangent and verify.

5. Draw a circle of radius 3.5 cm, construct two tangents from an external point which is 5.5 cm away from the circle.

6. Draw a circle of radius 4 cm and draw two radii which inclines an angle of 105^0. Construct tangents at the ends of radii to the circle.

7. Draw a circle of radius 3.5 cm construct a pair of tangents to a circle which inclines an angle of 70^0 with each other.

8. Draw a circle of radius 3 cm and a chord 5 cm, construct a tangent at one end of the chord.

II. Three marks questions.

1. Construct a triangle of sides 4 cm, 6 cm and 7 cm and then construct a triangle similar to it whose sides are ⅔ of the corresponding sides of the first triangle.
2. Construct an isosceles triangle whose base is 8 cm and altitude 4 cm and then another triangle whose sides are 2⅓ times the corresponding sides of the isosceles triangle.
3. Draw a triangle ABC given BC=7cm, ∟B=55^0, ∟A=100^0 then construct a triangle whose sides are $^4/_3$times the corresponding sides of the triangle ABC.
4. Draw a right angled triangle in which the sides other than the hypotenuse are of lengths 4 cm and 3 cm. Then construct another triangle whose sides are $^3/_5$times the corresponding sides of the given triangle.

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UNIT -6:- Co-ordinate Geometry

I. Choose the correct answer for the fallowing questions.

1. **The Coordinate of origin is**

   A) (1,1) **B) (0,0)** **C) (0,1)** **D) (1,0)**

2. **The Point of co-ordinates satisfying 2x+y=6 is**

   A) 1,1 **B) 2,2** **C) 3,3** **D) 4,4**

3. **The perpendicular distance of point P (4,3) from x axis is**

   A) 4 units **B) 1 Unit** **C) 3 units** **D) 5 units**

4. **If the distance between p (x,y) from origin is 10 units then coordinates of P is**

   A) (6,4) **B) (8,2)** **C) (5,5)** **D) (10,10)**

5. **If the midpoint of A (x,y) & B(4,7) is P(3,5) then the coordinates of A is**

   A) (2,6) **B) (7,12)** **C) (1,2)** **D) (2,3)**

II. one - mark questions.

6. **Write the formula to find the distance between $A(x_1,y_1)$ and $B(x_2,y_2)$.**
7. **Three points P, Q & R are collinear. What is the area of triangle formed by these points?**
8. **Find the midpoint of A(3,8) & B(-7,4).**
9. **Name the axis through which x = -3 passes.**
10. **Name the axis through which point P(0,4) passes.**

III. 2/3-mark questions.

11. **Find the distance between (2,3) and (4,1).**
12. **Check whether points (1,5), (2, 3) an (-2,-11) are collinear.**
13. **If the points A(x,2) B(-3,4) and C(7,8) are collinear. What is the value of x?**
14. **If two adjacent vertices of a parallelogram are (3,2) and (-1,0) and the diagonals intersect at (2,-5). Find the co-ordinates of the other two points.**
15. **Check whether points (5,-2), (6, 4) and (7,-2) form vertices of an isosceles triangle.**
16. **Find the value of y, if the distance between points (2,-3) & (10,y) is 10 units.**

17. Find the coordinates of points which divide the line joining points (4,-3) & (8,5) internally in the ratio 3:1.

16. Find the ratio in which the points P(2,x) divides the line joining the points A(-2,2) and B(3,7) internally. Also find the value of x.

17. Find the point on the x-axis which is equidistance from (2,-5) and (-2,9).

18. In what ratio point (-4,6) divides the line joining points (-6,10) and (3,-8) ?

19. If A(2,-3) & B(1,4) are the ends of diameter AB of a circle. Find the coordinates of centre of circle.

20. Find the area of triangle whose vertices are (2,3),(-1,0) and (2,-4)

V. Four marks questions.

21. Show that points (3,0),(6,4) & (-1,3) are the vertices of a right angled triangle.

22. Show that points (2,-2), (5,4), (5,9) & (2,3) form the vertices of a rectangle.

23. In the triangle ABC P(3,1), Q(5,6) and R(-3,2) are the mid points of AB, BC and CA respectively. Find the vertices of the triangle ABC and show that area (ΔABC) = 4x area (ΔPQR).

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Unit -7 :-Quadratic equation

I Choose the correct answer for the fallowing questions.

1. If the roots of $ax^2 + bx + c = 0$ are equal then,

   A) $\frac{b}{2a} = \frac{2c}{b}$ B) $b^2 + 4ac = 0$ C) $\frac{b}{2a} = \frac{b}{2c}$ D) a = b

2. If one root of $px^2 + qx + r = 0$ is reciprocal of the other root then,

   A) p = q B) q = r C) p = r D) p = q = r

3. The sum of the roots of $3x^2 + 6x + 3 = 0$ is

   A) 2 B) -3 C) 1 D) -2

4. If one root of $2x^2 + kx + 4 = 0$ is -2, then the value of k is

   A) 12 B) -6 C) 6 D) -12

5. The nature of the roots of $2x^2 – 4x - 3 = 0$ is

   A) Real & distinct B) real & equal C) no real roots D) imaginary roots

6. The roots of quadratic equation $3x^2 – 6x = 0$ are

   A) (0,2) B) (3,6) C) (0,-2) D) (0,6)

7. The sum of the squares of two consecutive natural numbers is 20. Representing this statement in the form of quadratic equation is,

   A) $X^2 + (x + 1)^2 = 20$ B) $x^2 – (x – 1)^2 = 20$ C) $(x + 1)^2 – x^2 = 20$ D) $x^2+(x+1)^2+20=0$

II. One mark questions.

8. Write the standard form of quadratic equation.
9. Write the formula to find the roots of $ax^2 + bx + c = 0$.
10. Write the quadratic equation whose roots are x = 2 & x = -3.
11. If the roots of $6x^2 – 24x + c = 0$ are equal, then find the value of c.
12. Determine whether -3 is a root of the equation $3x^2 + 5x – 8 = 0$.

III. Two mark questions.

13. Check whether, $y(y+7) + 9 = (y+7)(y-7)$ form a quadratic equation.
14. If the roots of $9x^2 + 3kx + 4 = 0$ are equal, then find the value of k.

15. **Find the roots of $3x^2 - 11x + 8=0$ by factorization method.**
16. **Check the nature of the roots of $2x^2 + 5x + 5 = 0$.**
17. **A chess board contains 64 equal squares & the area of each square is 6.25 cm^2. A border around the board is 2cm wide. Find the length of each side of the chess board.**
18. **Find the quadratic equations whose roots are $2\sqrt{3}$ and $-2\sqrt{3}$.**
19. **The area of a triangular plot is 156cm^2. The base of the plot is 2cm more than twice its height. Form a quadratic equation.**
20. **Solve by using formula:**

    a) $3x^2 - 7x - 6 = 0$ b) $\sqrt{3}x^2 - 2\sqrt{3} = 2\sqrt{2}x$ c) $4x^2 - 196 = 0$

IV. Three mark questions.

21. **If one root of the equation $x^2 + px + 24 = 0$ is 4, while the equation $x^2 + px + q$ has equal roots. Find the value of q.**
22. **If $-\frac{3}{2}$ and $\frac{5}{2}$ are the roots of $mx^2 + 4x - n = 0$ then find the value of m and n.**
23. **If $x^2 - (2a+1)x + 6 = 0$ has one root as x = 2; find the value of 'a' and find the other root of given equation.**
24. **The perimeter of a right triangle is 60 cm. Its hypotenuse is 25 cm. Find the area of the triangle.**
25. **Sum of the areas of two squares is 468 m^2. I f the difference of their perimeter Is 24 m, find the sides of two squares.**
26. **The sum of the squares of two consecutive natural numbers is 365. Find the numbers.**
27. **The perimeter of rectangular field is 28 cm and its area is 48 cm^2. Find its length and breadth.**
28. **Find the roots of the equation:**

    $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$, x ≠-4,7.
29. **The sum of the ages of a father and his son is 45 years. Five years ago the product of their age was 124. Determine their present ages.**

V. 4/5 mark questions.

30. **A two-digit number is four times the sum of their digits. It is also equal to 3 times the product of their digits. Find the number.**
31. **Two pipes running together can fill a tank in $11\frac{1}{9}$ 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.**
32. **The diagonal of a rectangular field is 16m more than the shorter side. If the longer side is 14m more than the shorter side. Find the length of the sides of the field.**
33. **A motor-boat, whose speed is 9km/h in still water, goes 12 km downstream and comes back in 3 hours. Find the speed of the stream.**
34. **A piece of cloth costs Rs 200. If the piece was 5 m longer and each meter of cloth costs Rs 2 less; the cost of the piece would have remained unchanged. How long is the piece and what is the original rate per meter?**
35. **The time taken by a person to cover 150km was $2\frac{1}{2}$ hours more than time taken in 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.**
36. **Anirudh had bought certain number of books for Rs 60. If had he bought 5 more books for same amount, cost of each book would have been Rs 1 less. Find the number of books purchased by Anirudh and also the cost of each book.**

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Unit-8 : Introduction to Trignometry

I. Choose the most appropriate answer for the following questions.

1. $(1+\cos\theta)(1-\cos\theta) =$

a) $\sin^2\theta$ b) $\tan^2\theta$ c) 1 d) 0

2. $\sin A \cdot \cos A \cdot \tan A + \cos A \cdot \sin A \cdot \cot A =$

a) $\sin^2 A - \cos^2 A$ b) $\tan^2 A + \cot^2 A$ c) $\sin^2 A + \cos^2 A$ d) $\sin^2 A + \tan^2 A$

3. If $1 - \cos^2\theta = \frac{3}{4}$ then the value of $\sin\theta$

a) $\frac{\sqrt{3}}{2}$ b) $\frac{1}{2}$ c) 1 d) 0

4. $2\cos\theta = 1$ and θ is an acute angle then the value of 'θ'

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

5. If $\sin\theta = \frac{3}{5}$ then the value of $\operatorname{cosec}\theta$

a) $\frac{4}{5}$ b) $\frac{5}{3}$ c) $\frac{4}{3}$ d) $\frac{5}{4}$

6. If $\sin\theta = \cos\theta$ then the value of θ

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

7. maximum value of $\sin\theta$ is

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

8. The value of $\cos 48^0 - \sin 42^0$ is

a) 0 b) $\frac{1}{4}$ c) 1 d) $\frac{1}{2}$

9. If $13\ \sin\theta = 5$ then the value of $\tan\theta$

a) $\frac{5}{12}$ b) $\frac{12}{5}$ c) $\frac{12}{13}$ d) $\frac{5}{13}$

10. The value of $\frac{tan65}{cot25}$

a) $\sqrt{2}$ b) 0 c) 1 d) $\frac{1}{\sqrt{2}}$

II. very short answer questions (1 mark)

1. Find the value of $\sin 90^0 + \tan 45^0$.

2. Find the value of $\sin\theta \times \operatorname{cosec}\theta$.

3. If $\sqrt{3}\cot A = 1$ then find the value of acute angle A.

4. Find the value of $\operatorname{cosec} 31^0 - \sec 59^0$.

5. Find the value of $\frac{1 - \tan 45}{1 + \tan 45}$

6. Find the value of $\sin\theta \times \operatorname{cosec}\theta$.

7. If $\sin\theta = \frac{2}{\sqrt{3}}$ and $\cos\theta = \frac{3}{\sqrt{3}}$ then find the value of $\tan\theta$.

8. If $\cos A = \sin B$ then show that $A+B=90^0$.

9. Evaluate $\cot 23^0 . \tan 67^0$

10. Show that $(1+\tan^2\theta).\cos^2\theta = 1$

III. 2 marks questions.

1. If $\tan 2A = \cot(A-18^0)$ and $2A$ is an acute angle then find A.

2. If $\cos(A+B)=0$ and $\sin(A-B)=\frac{1}{2}$ then find the value of A and B.

3. Show that $(\tan A \times \sin A) + \cos A = \sec A$

4. If $\cos\theta = 0.6$ then prove that $5\sin\theta - 3\tan\theta = 0$ (Hint: $0.6 = \frac{6}{10}$)

5. Evaluate $\sin 18^0 . \cos 72^0 + \cos 18^0 . \sin 72^0$.

6. If $A=60^0$, $B=30^0$ then show that $\cos(A+B) = \cos A.\cos B - \sin A.\sin B$

7. If $A=60^0$, $B=30^0$ then show that $\tan(A-B) = \frac{\tan A - \tan B}{1 + \tan A.\tan B}$

8. Show that $2\cos^2\theta - 1 = \cos^2\theta - \sin^2\theta$

9. $\frac{\sin\theta}{1-\cos\theta} = \operatorname{cosec}\theta + \cot\theta$

10. If $\tan A = \frac{5}{12}$ then show that $(\sin A + \cos A).\sec A$

IV. Prove that the following questions. (3 marks)

1. $\sqrt{\frac{1+sinA}{1-sinA}}$ = secA +tanA

2. (1+cotθ - cosecθ) (1+tanθ + secθ) = 2

3. If tan(A+B) =$\sqrt{3}$and tan(A-B)= $\frac{1}{\sqrt{3}}$, Here 0^0<(A+B) ≤90^0; then find the value ofA and B.

4. $\frac{sin(90-\theta)}{1+\sin\theta} + \frac{cos\theta}{1-cos(90-\theta)}$ =2secθ

5. $\frac{\tan A+\sec A-1}{tanA-secA+1} = \frac{1+sinA}{\cos A}$

6. $\tan^2 A-\sin^2 A = \tan^2 A.\sin^2 A$

7. $\frac{1-cos\theta}{1+\cos\theta}$ = (cosec θ -cotθ)^2

8. $\frac{sin\theta}{1+\cos\theta} + \frac{1+cos\theta}{sin\theta}$ = 2 cosec θ

9. x= a secθ + b tanθಮತ್ತುy= a tan θ + b sec θಆದರೆ $x^2 - y^2 = a^2 - b^2$

10. (sinA+cosecA)^2 + (cosA+secA)^2= 7+$\tan^2$A+$\cot^2$A

V. Prove that the following questions. (4 marks)

1. $\frac{sin(90-A)}{1-tanA} + \frac{cos(90-A)}{1-cotA}$ = cosA +sinA

2. $\frac{cosecA+1}{cosecA-1}$ =(secA+tanA)^2

3. $\frac{sinA}{\sec A+\tan A-1} + \frac{cosA}{cosec A+\cot A-1}$ =1

4. If secA=x+$\frac{1}{4x}$thensecA-tanA =$\frac{1}{2x}$

5. $\frac{tan\theta}{1+cot\theta} + \frac{cot\theta}{1-tan\theta}$ =1+tanθ+cotθ

6.$\sqrt{sec^2\theta + cosec^2\theta}$ = tan θ + cot θ

7. $\sqrt{\frac{1-cos\,\theta}{1+cos\theta}} + \sqrt{\frac{1+cos\theta}{1-cos\theta}}$= 2 cosec θ

8. sec θ = x + $\frac{1}{4x}$ಆದರೆsec θ + tanθ =2x

9. $\frac{1}{sec\,A+tan\,A}-\frac{1}{cosA}=\frac{1}{cosA}-\frac{1}{secA-tanA}$

10. $\left(\frac{1+sin\theta-\cos\theta}{1+sin\theta+\cos\theta}\right)^2=\frac{1-cos\theta}{1+cos\theta}$

VI. Prove that the following questions. (5 marks)

1. $\frac{cos\theta}{cosec\theta+1}=\frac{cos\theta}{cosec\theta-1}$ = 2 tan θ

2. $\frac{cosec\theta-\sin\theta+1}{cos\theta+\sin\theta-1}$ = cosec θ +cot θ

3. (cosec θ - sec θ)(cot θ - tan θ) = (cosec θ + sec θ)(sec θ .tan θ − 2)

4. $\frac{cosA.cosecA-\text{sinA.secA}}{cos\text{A}+\text{sinA}}$ = cosec A –sec A

5. $\frac{sec\theta-\tan\theta}{sec\theta+\tan\theta}$ = $1+2\tan^2\theta$ - 2secθ.tanθ

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Unit-9:- Some applications of Trignometry

I. 2 Marks questions.

1. Find the angle of depression, when a person standing on the ground is observed from the tip of the tower $50\sqrt{3}$m high, who is standing $50\sqrt{3}$m away from the foot of the tower.

2. A tower stands vertically on the ground from a point on the ground which is 15 m away from the foot of the tower, the angle of elevation of the top of the tower is found to be 60^0. Find the height of the tower.

3. An observer 1.5 m tall is 28.5 m away from a chimney. The angle of elevation of the top of the chimney from her eyes is 45^0. What is the height of the chimney?

4. The angle of elevation of the top of a tower from a point on the ground, which is 30 m away from the foot of the tower is 30^0. Find the height of the tower.

5. A tower stands vertically on the ground from a point on the ground which is 50 m away from the foot of the tower, the angle of elevation of the top of the tower 60^0. Find the height of the tower.

6. Two wind mills of height 50 m and 40 m are on either side of the field. A person observes the top of the wind mills from a point on the ground in between the towers. The angle of elevation was found to be 45^0 in both the cases, find the distance between the wind mills.

7. A ladder 15 m long just reaches the top of vertical wall. If the ladder makes an angle of 60^0 with the wall, find the height of the wall.

8. The top of a pole standing perpendicular to the ground is observed from a point 60 m apart from the foot of the pole on the ground, then the angle of elevation is 30^0, find the height of the pole.

9. The tip of a tower is observed from a point on the ground which is 30 m apart from its base, then the angle of elevation is 30^0, find the height of the tower.

10. A kite is flying at a height of 60 m above the ground. The string attached to the kite is tied toa point on the ground. If the inclination of the string with the ground is 600, find the length of the string assuming that there is no slack in the string.

II. 3 Marks questions.

1. A tree breaks due to storm and the broken part bends that the top of the tree touches the ground making an angle of 30^0 with it the distance between thefoot of the tree to the point where the top touches the ground is 8m. How tall was the tree.

2. The angle of elevation of the top of the building from the foot of tower is 30^0 and the angle of elevation of the top of the tower from the foot of the building is 60^0. If the tower is 50m high. Find the height of the building.

3. The angle of elevation of the top of a tower from two points at a distance of 4m and 9m from the base of the tower and in the same straight line with it are complementary. Prove that the height of the tower is 6m.

4.From the top of a building 16m high. The angular elevation of the top of a hill is 60^0 and the angular depression of the foot of the hill is 30^0. Find the height of the hill.

5. The angle of elevation of the top of a tower from a point A on the ground is 30^0 moving a distance of 20m towards foot of the tower to a point B, the angle of elevation increases to 60^0. Find the height of the tower and the distance of tower from the point A.($\sqrt{3}$ =1.732)

6. A man in a boat rowing away from a light house 150m high takes 2 minutes to change the angle of elevation of the top of the light house from 60^0 to 45^0. Find the speed of the boat.

7.From the top of a building 60 m high, the angles of elevation and depression are found to be 60^0 and 30^0, when the tip and base of a hill are observed respectively. Find the height of the hill.

8. A tower has a flagstaff at its tip. A person observes the tip and base of the flagstaff from a point on the ground at a distance of 9 m from the base of the tower. The angles of elevation are 60^0 and 30^0 respectively. Find the height of the flagstaff.

9. From the top of a hill, the angle of depression of two consecutive milestones are found to be 30^0 and 45^0. Find the height of the hill.

10. From the top of 7 m high building, the angle of elevation of the top of a tower is 60^0 and angle of depression to its foot is 45^0. Find the height of the tower.

III. 4 Marks questions.

1. A boy observes the tip of a tower fixed on the top of a building of height 14m from a point on the ground, then the angle of elevation is 45^0. While walking towards the building again he observes the tip and base of the tower from another point, now if angles of elevation are 60^0 and 30^0 respectively. Find the height of the tower and the distance he walked.

2. Two poles of equal heights standing opposite each other on either side of the road, which is 80m wide. From a point between them on the road, the angle of elevation of the top of the poles are 60^0 and 30^0 respectively. Find the height of the poles and the distances of the point from the poles.

3. A statue, 1.6m tall, stands on the top of a pedestal. From a point on the ground, the angle of elevation of the top of the statue is 60^0 and from the same point the angle of elevation of the top of the pedestal is 45^0. Find the height of the pedestal.

4. A 1.5 m tall boy is standing at some distance from a 30m tall building. The angle of elevation from his eyes to the top of the building increases from 30^0 to60^0 as he walks towards the building. Find the distance he walked towards the building.

5. A straight high way leads to the foot of a tower. A man standing on the top of the tower observes a car at an angle of depression of 30^0, which is approaching to the foot of the tower with uniform speed. Six seconds later, the angle of depression of the car is found to be 600. Find the further time taken by the car to reach the foot of tower.

6. A 1.2 m tall girl spots a balloon moving with the wind in a horizontal line at a height of 88.2.m from the ground. The angle of elevation of the balloon from the eyes of the girl at that instant is 60^0. After some time the angle of elevation reduces to 30^0. Find the distance travelled by the balloon during the interval.

7. The angles of elevation of top of a tower from two points at a distance 4 m and 6 m from the base and in the same line with it are complimentary. Find the height of the tower.

8. The angle of elevation of a cloud from a point 60 m above a lake is 30^0 and angle of depression of reflection of cloud in the lake is 60^0. Find the height of the cloud from the surface of the lake.

IV. 5 Marks questions.

1. At the fod of a mountain the elevation of its summit is 45^0, after ascending 1000 m towards the summit up a slope of 300 inclination, the elevation from that point to the tip is found to be 60^0. Find the height of the mountain. (take$\sqrt{3}$ =1.732)

2. The angle of elevation of a jet plane from a point A on the ground is 60^0. After flight of 30 seconds, the angle of elevation changes to 30^0. If the jet plane is flying at a constant height of $3600\sqrt{3}$m above the ground, find the speed of the jet plane.

3. From an aeroplane vertically above a straight horizontal road the angles of depression of two mile stones on the either side of the aeroplane are observed to be 'a' and 'b'. Show that the height of the aeroplane above the road is$\frac{tana.tanb}{tana+tanb}$

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Chapter-10:-STATISTICS

I. Multiple choice(1 mark) questions.

1) **The mean value of 6, 9, 11, 12 and 7 is**

   a) 10 b) 9 c) 11 d) 12

2) **If the mean value of 6, 4, 7, 'a' and 10 is 8, then the value of 'a' is**

   a)10 b) 17 c) 9 d) 13

3) **The median of 3, 5, 7, 3, 8, 0, 1, 4 and 6 is**

a) 0 b) 8 c) 4 d) 3

4) **The mode of the data 4, 7, 4, 3, 2, 7, 7, 6, 4, 7 and 8 is**

a) 7 (b) 6 (c) 4 (d) 8

II. 2 marks questions.

1) Find the mean of the following data.

C.I	10-25	25-40	40-55	55-70	70-85	85-100
f	2	3	7	6	6	6

2) Find the mode for the following distribution.

C.I	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55
f	3	8	9	10	3	0	0	2

3) Find the median of the following data.

C.I	f
20-40	1
40-60	15
60-80	20
80-100	8

II. 3 mark questions.

III. The total number of the observations in the following distribution table is 120 and their mean is 50. Find the values of missing frequencies f1 and f2.

Class	0-20	20-40	40-60	60-80	80-100
Frequency	17	f1	32	f2	19

1) The following table gives the age of 50 students of a class. Find the arithmetic mean of their ages.

Age in years	16-18	18-20	20-22	22-24	24-26
No. of students	2	7	21	17	3

2) The following are the marks obtained by 70 boys in a class test. Calculate the mean.

Marks	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of boys	10	12	14	12	9	7	6

3) Draw a less than and more than type Ogive curve for the following data

Class	0-10	10-20	20-30	30-40	40-50
Frequency	4	9	15	14	8

4) Draw a more than type Ogive curve for the given data.

Class	10-15	15-20	20-25	25-30	30-35
Frequency	11	25	12	5	2

5) In the school 100 people have heights are tabulated below.

Heights in cm	121-130	131-140	141-150	151-160
No. of people	12	16	30	20

Find the median height by drawing Ogive curve.

6) Find the mode of the following frequency distribution

Class	20-30	30-40	40-50	50-60	60-70	70-80
frequency	4	7	9	11	6	2

7) Find the mode of the following data

Class	0-10	10-20	20-30	30-40	40-50
Frequency	5	12	20	9	4

8) The following table shows the expenditure of 60 students in book. Find the mode of their expenditure.

Expenditure	20-25	25-30	30-35	35-40	40-45	45-50
No. of students	4	7	23	18	6	2

9) Find the median for the following data.

Class	10-20	20-30	30-40	40-50	50-60
Frequency	8	4	6	2	6

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Unit -11:-SURFACE AREA AND VOLUME

I. Multiple choice questions one mark each.

1) The height of the cylinder is 20 cm and radius is 7cm the volume of a cylinder is.

A) 3080 cm^3 B) 3080 cm^2 C) 3080 cm D) 3080 cm^4

2) A rectangular tank is 25 m long and 9.5m deep. If 600 m^3 of water to be drawn off the tank the level of water goes down by 1.5 m then the width of the tank is.

A) 18m B) 17m C) 16m D) 19m

3) The volume of one sphere is 27 times that of another sphere. Calculate the ratio of their radii.

A) 1:27 B) 3:27 C) 9:81 D) 3:9

4) A cylindrical pencil sharpened at one end it is a combination of.

A) Two cylinders B) Hemisphere and cylinder C) Cone and cylinder D) Frustum of a cone and cylinder

5) The total surface area of a hemispherical solid having 7 cm radius is.

A) 462 cm^2 B) 294 cm^2 C) 588 cm^2 D) 154 cm^2

6) The surface area of a sphere is 616cm^2 its radius is.

A) 7 cm B) 14 cm C) 21 cm D) 28 cm

7) A cylinder and cone are of same base radius and of same height. The ratio of their volumes is.

A) 2:1 B) 3:1 C) 2:3 D) 3:2

8) If two solid hemispheres of same radius are joined together along their bases. Then surface area of this new solid is.

A) $3\pi r^2$ B) $4\pi r^2$ C) $5\pi r^2$ D) $6\pi r^2$

9) A solid has been melted and recast in to a wire which of the following remains the same.

A) Length B) Height C) Radius D) volume

II. ONE MARK QUESTIONS.

1) How many balls each of radius 1 cm can be made by melting a bigger ball whose diameter is 18 cm?

2) A spherical ball of lead has been melted and made in to identical smaller balls with radius equal to half the radius of the original one. How many such balls can be made?

3) Volume and surface area of a solid hemisphere are numerically equal. What is the diameter of the given hemisphere?

III. TWO MARK QUESTIONS.

1) How many litters of water flows out of a pipe of crass section area 5cm^2 in one minute if the speed of the water in the pipe is 30 cm/s. (1 litter=1000 cm^3)

2) The surface area of sphere is 2464 cm^2 find its volume.

3) Eight metallic spheres each of radius 2 mm are melted and recast in to a single sphere. Calculate the radius of the new sphere.

4) A right circular con of radius 3cm has a curved surface area 47.1 cm^2. Find the volume of cone ($\pi = 3.14$)

5) The volume of a sphere is 38808 cm^3 find its diameter and surface area.

6) A cone and a hemisphere have the same base and the same height. Find the ratio between their volumes.

IV. THREE MARK QUESTIONS.

1) The height and the radius of base of a cylinder are in the ratio 3:1. If its volume is 1029π cm^3, find its total surface area.

2) A metal cube of side 11 cm is completely submerged in water contained in a cylindrical vessel with diameter 28 cm. Find the rise in the level of water.

3) A solid cone of a base radius 10 cm is cut into two parts through the midpoint of its height by a plane parallel to its base. Find the ratio of the volume of the two parts of the cone.

4) A solid metallic sphere of diameter 8 cm is melted and drawn into a cylindrical wire of uniform width if the length of the wire is 12 m find its width.

5) A drinking glass is in the shape of the frustum of a cone of height 14 cm the diameter of its two circular ends are 4 cm and 2 cm. Find the capacity of the glass.

V. FOUR MARK QUESTIONS.

1) The sum of the radius of base and height of a solid right circular cylinder is 37 cm. If the total surface area of cylinder is 1628 cm^2 find the volume of the cylinder.

2) A vessel is in the form of a hemispherical bowl is surmounted by a hallow cylinder of same diameter. The diameter of the hemispherical bowl is 14 cm and the total height of the vessel is 13 cm. Find the inner total surface area of the vessel.

3) A solid wooden toy is in the form of a hemisphere surmounted by a cone of same radius. The radius of hemisphere is 3.5 cm and the total wood used in the making of toy is 166⅔ cm^3. Find the height of the toy also find the cost of painting the hemispherical part of the toy at the rate of Rs 10 per cm^2.

4) 504 cones each of diameter 3.5 cm and height 3 cm are melted and recast into a metallic sphere. Find the diameter of the sphere and also find the surface area.

VI. FIVE MARK QUESTIONS.

1) A vessel in the form of an inverted cone is filled with water to the brim. Its height is 32 cm and diameter of the base is 25.2 cm. six equal solid cones are dropped in it, so that they are fully submerged. Asa result one fourth of water in the original cone over flows. What is the volume of each of the solid cones submerged?

2) From a solid cylinder of height 36 cm and radius 14 cm, a conical cavity of radius 7 cm and height 24 cm drilled out. Find the volume and the total surface area of the remaining solid.

3) A circus tent is cylindrical to a height of 4m and conical above it. If its diameter is 105 m and its slant height is 80 m. calculate the total surface area of canvas required. Also find the total cast of canvas used at rate of Rs 15 per meter of the width is 1.5 m.

4) Bucket open at the top is in the form of a frustum of a cone with a capacity of 12308.8 cm^3.The radius of the top and bottom circular ends are 20 cm and 12 cm respectively. Find the height of the bucket and the area of metal sheet used the making the bucket. (use π=3.14)