DAV PUBLIC SCHOOL, JHARSUGUDA

CLASS-IX

CHAPTER-1 NUMBER SYSTEMS

SECTION-A(1 MARKS)

1.Give one example of rational number and an irrational number whose sum is irrational and product is rational.

2.Find the value of $\frac{2^0+7^0}{5^0}$.

3.Find an irrational number between $\sqrt{2}\ and \sqrt{3}$.

4.Write 0.999…… in $\frac{p}{q}$ form.

5.If$(x-1)^2 = 8$, what is the value of$(x+1)^2$?

6.Find six rational numbers between 4 and 5.

7.Find the value of $0.12\overline{3}$.

8.Find the sum of square root of 256 and cube of 18.

9.Calculate the value of $2^{\frac{1}{3}}$ x $2^{\frac{-4}{3}}$.

10.Write three numbers whose decimal expansions are non-terminating non-recurring

SECTION-B(2 MARKS)

1.If$4^x - 4^{x-1} = 24$, then find the value of $(2x)^x$.

2.Simplify : $\sqrt{50} - \sqrt{98} + \sqrt{162}$.

3.If$a = 2, b = 3$,then find the value of$(a^b + b^a)^{-1}$.

5.Rationalize the denominator, $\frac{16}{\sqrt{41}-5}$.

6.Show how $\sqrt{5}$ can be represented on the number line.

7.Visualize 3.765 on the number line using successive magnification.

8.Simplify : $\sqrt[3]{2}$ x$\sqrt[4]{3}$.

9.Rationalize the denominator $\frac{1}{\sqrt{5}+\sqrt{2}}$ and subtract it from $\sqrt{5} - \sqrt{2}$.

10.Check whether 6,7,8 forms Pythagorean triplet or not.

11.Evaluate: $(81)^{0.16} \times (81)^{0.09}$

12.Find the product $\sqrt[3]{2} \times \sqrt[4]{2} \times \sqrt[12]{32}$

SECTION-C(3 MARKS)

1.Express 0.6+$0.\overline{7}$+$0.4\overline{7}$in$\frac{p}{q}$form.

2.Prove that, $\frac{1}{1+x^{a-b}} + \frac{1}{1+x^{b-a}} = 1$.

3.Prove that, $\frac{1}{2+\sqrt{3}}+\frac{1}{\sqrt{5}-\sqrt{3}}+\frac{1}{2-\sqrt{5}}$ = 0.

4.Locate$\sqrt{9.3}$ on number line and write its steps also.

5.Represent$\sqrt{5}$ on number line.

6.Express the following in the form $\frac{p}{q}$, where p and q are integers and q≠0.

(i)$0.6\overline{6}$ (ii)$0.4\overline{7}$ (iii)$0.\overline{001}$

7.What can the maximum number of digits be in the recurring block of digits in the decimal expansion of $\frac{1}{17}$? Perform the division to check your answer.

8.Classify the following numbers as rational or irrational:

(i)2-$\sqrt{5}$(ii)(3+$\sqrt{23}$)-$\sqrt{23}$(iii)$\frac{2}{7\sqrt{7}}$(iv)$\frac{1}{\sqrt{2}}$(v)2π

9.if$\frac{5+\sqrt{3}}{7-4\sqrt{3}}$ = 47a +$\sqrt{3}$ b,find the value of a and b

10.Find six rational numbers between $\frac{6}{5}$ and$\frac{7}{5}$.

11.Simplify: $\frac{2^{x+5}-4\times 2^{x}}{16\times 2^{x+2}-2^{x+3}}$.

12.Prove that: $\left(\frac{x^a}{x^b}\right)^{a+b}\times\left(\frac{x^b}{x^c}\right)^{b+c}\times\left(\frac{x^c}{x^a}\right)^{c+a}$ = 1

SECTION-D(4 MARKS)

1.Prove that $\sqrt[3]{6}$ is not a rational number.

2.If$x=\frac{\sqrt{3}+\sqrt{2}}{\sqrt{2}-\sqrt{3}}$ and If $y=\frac{\sqrt{3}-\sqrt{2}}{\sqrt{2}+\sqrt{3}}$ then find the value of x^2+y^2-10xy.

3.If$\frac{9^n\times 3^2\times\left(3^{\frac{-n}{2}}\right)^{-2}-27^n}{3^{3ms}\times 2^3}=\frac{1}{27}$, then prove that m-n=1.

4.If$a=5+2\sqrt{6}$ and $b=\frac{1}{a}\,then find the$ value of a^2+b^2 .

5.If$\frac{7+\sqrt{5}}{7-\sqrt{5}}-\frac{7-\sqrt{5}}{7+\sqrt{5}}$ = a+$\frac{7}{11}\sqrt{5}b$, then find the value of ‘a’ and ‘b’.

6.Find a and b if $\frac{3-\sqrt{6}}{3+2\sqrt{6}}$ = a$\sqrt{6}$ - b.

7.Simplify$\frac{2+\sqrt{5}}{2-\sqrt{5}}+\frac{2-\sqrt{5}}{2+\sqrt{5}}$.

8.Find the value of $\frac{3}{\sqrt{5}+\sqrt{2}}+\frac{7}{\sqrt{5}-\sqrt{2}}$.If $\sqrt{5}=2.236\ and\sqrt{2}$ =1.414.

9.If x = $\frac{\sqrt{3}+1}{2}$, find the value of $4x^3+2x^2-8x+7$.

10.If x = 2 +3$\sqrt{2}$,then find the value of (x + $\frac{14}{x}$).

11.If$2^a=3^b=6^c$,then show that c = $\frac{ab}{a+b}$.

12.if x = $\sqrt{3+2\sqrt{2}}$,find the value of x + $\frac{1}{x}$,x−$\frac{1}{x}$, $x^2-\frac{1}{x^2}\&x^2+\frac{1}{x^2}$.

13.If x =$\frac{\sqrt{p+2q}+\sqrt{p-2q}}{\sqrt{p+2q}-\sqrt{p-2q}}$,then show that $qx^2-px+q=0$.

14.If x = $\frac{\sqrt{2}+1}{\sqrt{2}-1}$ andy = $\frac{\sqrt{2}-1}{\sqrt{2}+1}$,find the value of $x^2 + y^2 + xy$.

CHAPTER-2 POLYNOMIALS

SECTION-A(1 MARKS)

1.Find the remainder when x^{100} is divided by $x + 1$.

2.Write the degree of the polynomial $2x^4 - 0x^7 + 3x^6 + 2$.

3.If$\frac{x}{y} + \frac{y}{x} = -1$, then find the value of$(x^3 - y^3)$.

4.Find "k" if$(x + y)^3 - (x - y)^3 - 6y(x^2 - y^2) = ky^2$.

5.If p(x)=$2x^3 - x^2 + 3x + 1$, find the value of $\frac{p(1)+p(-1)}{2}$.

6.What is the degree of zero polynomial ?

7.What is the maximum number of terms in a polynomial of degree 10 ?

8.What is the remainder when $x^3 - 2x^2$ + x +1 is divided by (x – 1) ?

9.If a + b + c =0 , then evaluate $a^3 + b^3 + c^3$.

10.Find the coefficient of a^3in the expansion of $(2a - 5)^3$.

11.Find the zero of the polynomial p(x) = 3x + 7.

12. If a + b+ c = 0 ,then find the value of (a + b)(b+ c)(c + a).

SECTION-B(2 MARKS)

1.If(x – 1) is a factor of the polynomial p(x) =$3x^4 - 4x^3 -$ ax +2,then find the value of a

2.Factorize :$x^2 + 3\sqrt{3}$ x + 6 .

3.For what value of k , x – 3 is a factor of p(x) = $x^3 - 6x^2$ + k x – 6 .

4. Find the value of $4x^2+9y^2$,if 2x +3y = 18 and x y = 5 .

5.If f(x) = x – 9 then find f(x) – f(– x).

6.Factorise: $2x^2 + y^2 + 8z^2 - 2\sqrt{2}xy + 4\sqrt{2}yz - 8zx$.

7.Using identity evaluate, 99^3.

8.Find the product, $\left(x - \frac{1}{x}\right)\left(x + \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2}\right)$.

9.Factorise, $x^2 + 3\sqrt{3}x + 6$.

10.Ifa+b+c = 0 ,then find the value of :$\frac{a+b}{c} + \frac{b+c}{a} + \frac{c+a}{b}$.

SECTION-C(3 MARKS)

1.Using factor theorem factorise, $x^3 + 6x^2 + 11x + 6$.

2.If a= 3+b then prove that, $a^3 + b^3 - 9ab = 27$.

3.Factrorise, $x^6 - 7x^3 - 8$.

4.If both (x−2) and $\left(x - \frac{1}{2}\right)$ are factors of $px^2 + 5x + r$, show that p=r.

5.Prove that, $a^3 + b^3 + c^3 - 3abc = \frac{1}{2}$(a+b+c)$\{(a-b)^2 + (b-c)^2 + (c-a)^2\}$.

6.Divide the polynomial $3x^4 - 4x^3$ −3x – 1 by x −1 and find its quotient and remainder

7. What must be added to $2x^3 - 4x + 9$ so as to get $5x^3 - 13$.

8.Find the possible dimensions for the cuboids whose volume is : V =$5x^2 - 25x$

9. Find the value of a & b so that the polynomial x^3 + $10x^2$ + ax + b is exactly divisible by (x−1) as well as (x+2) .

10.Show that P – 1 is a factor of $p^{10} - 1$ and also $p^{11} - 1$.

SECTION-D(4MARKS)

1.Find α &β , if (x + 1) & (x +2) are factors of $x^3 + 3x^2 - 2\alpha x + \beta$.

2. Factorize :a^7– a b^6.

3.If a + b + c =5 and a b + b c + c a = 10 ,then prove that $a^3 + b^3 + c^3$ −3abc = −25 .

4.Factorize :x^3+ 13 x^2 + 32x +20 .

5.If (x+a) is a factor of the polynomialx^2+p x + q andx^2+mx +n, prove that a = $\frac{n-q}{m-p}$.

6.Find the value of $(x-a)^3 + (x-b)^3 + (x-c)^3 - 3(x-a)(x-b)(x-c)$, if$a + b + c = 3x$.

7.Simplify, $\frac{(a^2-b^2)^3+(b^2-c^2)^3+(c^2-a^2)^3}{(a-b)^3+(b-c)^3+(c-a)^3}$.

8.Without actually division, Prove that, $2x^4 + x^3 - 14x^2 - 19x - 6$ is exactly divisible by$x^2 + 3x + 2$.

9.If$\sqrt{m} + \sqrt{n} + \sqrt{p} = 0$,then prove that m+n−p=4mn.

10.The polynomials $ax^3 + 3x^2 - 3$ and $2x^3 - 5x + a$ when divided by $(x-4)$ leaves the remainders R_1 and R_2respectively. Find the values of “a” in each cases,if

(i)R_1= R_2 (ii)2 R_1- R_2=0 .

11.prove that : $2x^3 + 2y^3 + 2z^3$− 6xyz = (x + y + z)($(x-y)^2$ + (y − z)^2 + (z − x)^2).

12. Factorise: i)$x^3 + \frac{1}{x^3} - 2$

ii)$\frac{x^3}{y^3} + \frac{y^3}{z^3} + \frac{z^3}{x^3} - 3$

CHAPTER-3 CO-ORDINATE GEOMETRY

SECTION-A(1 MARKS)

1.Find the image point of (−3, 2) with respect to Origin.

2.Find the distance between points (−4, 7) and (−4, 10).

3.Find the co-ordinate of a point whose perpendicular distance from x-axis and y-axis are 3 and 4 respectively.

4.Write the name and co-ordinate of the common point lies on both axes.

5.Write the name of the Quadrants where these points (1,v1), (2, −2), (4, −5), (−3, −4) arelie.

6.In which quadrants abscissa and ordinate have same signs?

7.Mark the point on y axis at a distance of four units in negative direction of y axis?

8.Find the perpendicular distance of a point P(4,6) from the x axis.

9.Write the equation of line passing through origin?

10.Where does the point (-2,4) lie in the coordinate plane?

SECTION-B(2 MARKS)

1.Write the names of Quadrants or axis where these points lie:
(−3,0); (1.5, −2.5);(0,7.5);(−3, −7).

2.Write abscissa and ordinate of any point on y-axis and x-axis respectively.

3.If (2x−1, y−7) = (3, −4) then find the values of 'x' and 'y'.

4.A point lies on x- axis at a distance of 9 units from y- axis. What are its coordinate?

5.What will be its co-ordinate if it lies on y- axis at a distance of −9 units from x axis?

6.In the adjacent figure$\Delta ABC and \Delta ABD$ are equilateral triangles. Findco-ordinatesof points 'C' and 'D'.

7.(−4,4) is a point in the iv quadrant . write true or false and justify your answer?

8.Is the points (−3,a) and (b,4) lie on the straight line with equation y=4x, find the values of a and b.

9.If the point (3,4) lies on graph of equation 3y=ax+7, find the value of a.

10.If the coordinates of two points are A(−2,5) and B(−7,8) then
find (abscissa of b) – (abscissa of A).

11.The distance of a point from x axis is 3units and form y axis is 5units. If the point lies in third quadrant , find the coordinates of the point.

SECTION-C(3 MARKS)

1.Locate points O(0,0);A(3,4),B(3, −4) on a certesian plane. Join the points. Write the name of the figure obtained?

2.Plot the points (2,3) ; (−2,3) ; (−2, −3); (2, −3) on a cetesian plane. Join the points. Also find the area of the figure so obtained.

3.Plot the co-ordinates of the point:

(i) Whose ordinate is −5 and which lies on y –axis.

(ii) Which lies on both axes?

(iii) Whose abscissa is 3 and which lies in Cartesian plane.

3.Find image point of (−5, −4) with respect toX-axis and Y-axis.

4.Draw quadrilateral with vertices (−4,4);(−6,0);(4, −4);(−2,0).Name type of

quadrilateral so formed.and also find its area

5.In which quadrant or on which axis does each of the points $(-2,4)$,$(3, -1)$, $(-1,0)$ and $(-3, -5)$ lie ? verify your answer by locating them on the Cartesian plane.
6.Plot the point P(4, -6) and from it draw PM and PN perpendicular to x axis and y axis respectively. Write the coordinates of the points M and N.
7.Plot the points P$(-2,1)$,Q(2,1) R(3,2) and S$(-1,2)$ and write the name of the figure thusobtained.
8.Plot the following points and write the name of the figure thus obtained: A(2,0) B(4,0),C(42) and D(2,2).
9.Plot the points p(2,0),Q (5,0) and S(2,3). Find the coordinates of the point R such that PQRS is a square.

SECTION-D(4 MARKS)

1.Without plotting the points indicate the quadrant in which they lie?
- (i) Ordinate is 5 and abscissa is -3.
- (ii) Abscissa is -5 and ordinate is -3.
- (iii) Abscissa is -5 and ordinate is 3.
- (iv) Ordinate is 5 and abscissa is 3.

2.Plot the points P (1, 0), Q (4, 0), S (1, 3). Find the co-ordinate of point R where PQRS is a square.
3.Write the co-ordinate of the vertices of a square whose each side is 5 units, one vertex at (2, 1) and all the vertices lie in the same quadrant.
4.Plot the points A(1, -3) and B(5,4) .
(I) Draw a line segment with these points. Write co-ordinates on this line segment $\overline{AB}$.
(II) Extend this line segment and write the co-ordinates of a point on the line which lies outside the line segment $\overline{AB}$.
5.Draw a trapezium ABCD in which vertices A,B,C and D are (4,6),($-2,3$),($-2, -5$)and (4, -7). Respectively.
6.Plot the points A(4,0) and B(0,4) . join A,B to the origin 0. Find the area of triangle ABC.
7.Three vertices of a rectangle are $(-1,1)$,(5,1) and (5,3).plot these points and find the coordinates of fourth vertex.
8.Find some ordered pairs (x,y) such that X+3y=6 and plot them . how many such ordered pairs can be found and plotted?
9.Write the coordinates of the vertices of a square whose side is 5units,one vertex at (2,1) and all the vertices lie in the same quadrant.
10.Draw the quadrilateral with vertices $(-4,4)$,($-6,0$) , $(-4, -4)$ and $(-2,0)$ name the type ofquadrilateral and find its area.

CHAPTER-4 LINEAR EQUATION IN TWO VARIABLES

SECTION-A(1 MARKS)

1.If$x-4=\sqrt{3}y$ is written in standard form $ax+by+c=0$,then find value of a, b, c.

2.If$x=2, y=1$ is a solution of $2x+3k=y$,then find the value of k

3.The equation $2x+5y=7$has a unique solution if $xandy$are?

4.What is equation of line parallel to y- axis?

5.Let$y$ varies directly as$x$. If $y=12$,when $x=4$,then form a linear equation.

6.Write equations of X-axis and Y-axis.

7.Write the number of solutions of equation $2x+3y-12=0$.

8.Represent$x=3$ in one variable.

9.At what point the graph of equation $x-y=4$ cut $x-axis$.

10.Write the common point of equation of $2x-5=0\ andy=7$.

11. how many solutons of a linear equation in two variables are there?

12.At which point the graph of the equation 2x + 3y = 2 cuts the y-axis?

13.What is equation of line parallel to x- axis?

SECTION-B(2 MARKS)

1.Find the value of 'k', if $x=2, y=1 isasolutionof\ 2x+3y=k$.

2.Determine the point on which the graph of linear equation $2x+5y=19, whoeordinateis\ 1\frac{1}{2}$ times its abscissa.

3.If point (3,4) lies on the line $3y=ax+7$, then find the value of 'a'.

4.Write any 4 solutions of $3x+4y=12$.

5.Find equation of straight line parallel to$x-axis$and passing through point (3,-4).

6.Find value of k,if line represented by the equation $2x-ky=9$ passes through the point$(-1,-1)$

7.Draw graph of the equation $6-1.5x=0$.

8. If $x=3, y=-2$ is a solution of the linear equation $3x-ky=1$,then find value of k.

9.Write the coordinates of any two points which lie on the line$x+y=8$. How many such point exists?

10.Express$y$ in terms of$x$, given that $2x-5y=7$. Check whether the points $(-3,-2)$is on the given line.

11.The graph of linear equation x – ky – 10 = 0 passes through the point (11,5), find the value of k.

SECTION-C(3 MARKS)

1.Find four solution of the following linear equation in two variables:2(x+3) -3(y+1)=0

2.Check by substituting whether $x = -6$ and $y = -3$ is a solution of 2(x$-$1) $-$5y=1.find one more solution, how many more solution can you find.

3.Find three solution of equation$2x + 3(y - 1) = 13$. How many solution this equation has?

4.Express the linear equation 6=4x in the form ax +by+ c and indicate the value of a , b, c

5.Give the geometrical representation of 2x + 9 =0as an equation in
(a)one variable (b)two variables

6.Draw the graph of equation$x + y = 7$. Also find the area of the region bounded by co-ordinate axis and the line.

7.Give the geometric representation of $2x + 9 = 0$ as an equation,
(i) In one variable.
(ii) In two variable.

8.Find the value of 'k',if$x = 2, y = 1$is a solution of the equation $2x - 5y + k = 0$.

9.Draw the graph of the line $x - 2y = 3$. From the graph ,find the co-ordinates of the point when, (i) $x = -5$ (ii) $y = 0$ (iii) $x = 0$.

10.Draw the graph of linear equation $x = 4\ and y = 5$. Find the area formed by the two graphs and the axes.

11.The length of rectangle field is thrice its breadth.If the perimeter of rectangle is 80 cm,find the length and breadth of the rectangle.

SECTION-D(4 MARKS)

1.Two years later a father will be 8 years more than three times the age of son. Find the age of father when sons age is 10 years. Also write the equation and draw the graph for same.

2.Yamini and Fatima, two students of class IX contributed Rs.100 towards the PM's relief fund to help the earthquake victims. Form a linear equation which satisfies the data also draw graph for the same.

3.The cost of 5 tables exceeds the costs of 8 chairs by Rs.150. form a linear equation to represent the statement. also find cost of table if each chair costs Rs.240

4.Find m, if point (7, -3) lies on the equation $\left(y - \frac{3}{7}\right) = m(x - \frac{2}{7})$

5.Draw the graph of two lines, whose equations are $3x - 2y + 6 = 0\ and x + 2y - 6 = 0$ on the same graph paper. Find the area of the triangle formed by the two lines and X-axis.
6.A part of monthly charges is fixed and the remaining depends on the number of days one has taken food in the mess .A student has to pay ₹ 900 if she takes food for 10 days .Write the linear equation which satisfies this data. Draw the graph for the same.
7.In an election, a good candidate may lose because 40% of voters do not cast their votes due to various reasons. Form an equation and draw the graph with data.From the graph, find:

(i) If total number of votes is 1200, find the number of votes cast number of votes cast?

(ii) The number of votes cast, if the total number of votes are1000.

(iii) What message did you get from above information?

8.The ratio of girls and boys in a class is 1:3.Set up an equation between the students of that class and draw a graph. Also find the number of boys in a class of 40 students from the graph.
9.If$x = -2$and $y = 6$ is a solution of equation $3ax + 2ay = 6$ then find the value of 'a' and then from $2(a - 1) + 2(3b - 4) = 4$, find the value of 'b'.
10.The auto –rikshaw fare in a city is charges ₹ 10 for first kilometer and ₹ 4 per Kilometer for subsequent distance covered.Write the linear equation to express the Above statement,draw the graph of the linear equation.
11.Sohan gets 3 marks for each correct answer and loses 2 marks for each wrong answer,he attempts 30 questions and obtained 40 marks. Find the number of questions solved correctly.

CHAPTER-5 INTRODUCTION TO EUCLID'S GEOMETRY

SECTION-A(1 MARKS)

1- What is Euclid's fifth axiom ?
2- It is known that a= 2b and c=2b then a=c. which Euclid's axiom illustrates this statement?
3- What are the shape of boundaries of surfaces?
4- It is known that x= 2z and y=2z then x=y. which axiom of Euclid's does this statement illustrates?
5- To which country does Thales belong?

SECTION-B(2 MARKS)

6- In geometry, we take a point,a line and a plane as defined terms. Write true or false and justify your answer?
7- If P,Q and R are three points on a line and Q lies between P and R, then prove that PQ+QR = PR.
8- Kavita and Radhika have the same height. If their heights increase by 5cm each,how will their new heights be compared?

9- If x=y and y+ z=5 then show that x+z=5.

10- Two households have same monthly expenditure. If in a particular month, their expenditure increases by ₹ 2000,compare their expenditure for this particular month.

SECTION-C(3 MARKS)

11- It is known that x+y=10 and x=z. show that z+y=10

12- Show that two lines parallel to the same line are parallel to each other.

13- Prove that an equilateral triangle can be constructed on any given line segment.

14- If a point E lies in between two points Dand F such that DE=EF, then prove that DE=1/2 DF. Explain by drawing the figure.

15- Prove that two distinct lines cannot have more than one point in common.

SECTION-D(4 MARKS)

16- Solve the equation u−5=15 and state the axiom that you use here.

17- If a point O lies between two points P and R such that PO=OR then prove that PO = ½ PR.

18- Prove thatevery line segment has one and only one mid- point.

19- Read the following statements which are taken as axioms:

(i) If a transversal intersects two parallel lines , then corresponding angles are not necessarily equal.

(ii) If a transversal intersects two parallel lines , then alternate interior angles are equal. Is this system of axioms consistent? Justify your answer.

20- Read the following two statements which are taken as axioms:

(i) If two lines intersect each other, then vertically opposite angles are not equal.

(ii) If a ray stands on a line, then sum of two adjacent angles so formed is equal to 180.

CHAPTER-6 LINES AND ANGLES

SECTION-A(1 MARKS)

1).If AB=x+3,BC=2x and AC=4x−5, then for what value of x BC lies on AC?

2).Find the measure of the angle which is complement to itself.

3).What is the sum of angles at a point?

4).Find the angle which is twice its supplement?

5).How many triangles can be drawn having its angles as 60^0,90^0,30^0 degree?

SECTION-B(2 MARKS)

1).Find the angle which is one fifth of its complement?

2).Find the angle which is half of its complement?

3).Two supplementary angles differ by 30 degree. Find the angles.

4).Find the angle whose complement is equal to the angle itself?
5).Two adjacent angles on a straight line are in the ratio 3:2. Find the measure of each angle?
6).if a ray stands on a line such that difference of adjacent angles so formed is 30^0,then find the measure of each adjacent angle in degree.
7).If a ray OC stands on the line AB.If$\angle AOC = 6x + 30^0$&$\angle BOC = 4x$,then find x.
8).Lines PQ and RS intersect at point o.If$\angle POR : \angle ROQ = 5 : 7$, find all the angles.
9).If a ray OR stands on PQ such that $\angle POR = \angle ROQ$,then show that OR is perpendicular to PQ.
10).Prove that the lines which are perpendicular to the same line , are parallel to each other.
11)If the angles of a triangle are in the ratio 2: 3 : 4, then find the values of the biggest and smallest angles.
12.Sum of two angles of a triangle is 80^0 and their difference is 20^0. Find all angles of the triangle.
13)In right angled ΔABC ,$\angle A = 90^0$, and bisectors of Interior $\angle B$ and $\angle C$ meet at O, find$\angle BOC$.
14)In a triangle ABC, $\angle A = 90^0 \text{ and } AL \perp BC$, prove that $\angle BAL = \angle ACB$

SECTION-C(3 MARKS)

1).In a triangleABC ,$\angle C = \angle A$, AC−AB=3cm and its perimeter is 15 cm .
find AC?
2).Find the angle whose supplement is six times its complement?
3).The angles of a triangle are in the ratio 6:7:2. Find the angles of the triangle?
4).Prove that the sum of the angles of a triangle is 180 degree.
5).If the bisector of angles B and C of a triangle ABC meet at a point O, then prove that $\angle BOC = 90^0 + \frac{1}{2}\angle A$.
6).POQ is a line, ray OR is perpendicular to line PQ,OS is another ray lying between rays OP and OR. Prove that $\angle ROS = \frac{1}{2}(\angle QOS - \angle POS)$.
7).Prove that internal and external bisectors of an angle make a right angle with each other.
8).Point O is the common end point of the rays OA ,OB ,OC ,OD &OE.Show that $\angle AOB + \angle BOC + \angle COD + \angle DOE + \angle EOA = 360^0$.
9).If a transversal intersects two lines such that the bisectors of a pair of corresponding angles are parallel,then prove that the two lines are parallel.
10)If a transversal intersects two parallel lines ,then prove that the bisectors of any two alternateangless are parallel.
11)If any side of a triangle is produced on both sides,then prove that the sum of exterior

angles is greater than two right angles.

12)In ΔABC side BC is produced to D and bisector of ∠A meets BC at L. Prove that ∠ABC + ∠ACD = 2∠ALC

13)In ΔABC, BA is produced to D and AE is the bisector of ∠CAD.If∠B = ∠C ,then prove That AE || BC .

SECTION-D(4 MARKS)

1).The degree measure of three angles of a triangle are x,y,z. if z = $\frac{x+y}{2}$ then find the value of z.

2).Prove that if arms of an angle are respectively parallel to the arms of another angle, then the angles are either be equal or supplementary.

3).Prove that if two lines intersect each other , then vertically opposite angles are equal.

4).If two parallel lines are intersected by a transversal prove that the bisectors of interior angles on the same side of transversal intersect each other at right angles.

5).Prove that sum of four angles around a point is 360^0.

6)If a transversal intersects two parallel lines, then prove that the bisector of two pair of interior angles form a rectangle.

7)If bisectors of interior angles ∠ABC and ∠BCA intersect each other at point O, then prove that $\angle BOC = 90^0 + \frac{1}{2}\angle A$

8) Side QR of the ΔPQR is produced to the point S. If the bisectors of ∠PQR and ∠PRS intersect at point T, then prove that $\angle QTR = \frac{1}{2}\angle QPR$.

9)Sides AB and AC of the ΔABC are produced to D and E respectively.If the bisectors of the exterior angles B and C intersect at point O, Prove that$\angle BOC = 90^0 - \frac{1}{2}\angle A$.

10)AP& BP are bisectors of two adjacent angles A and B of the quadrilateral ABCD. Then , prove that $2\angle APB = \angle C + \angle D$.

11)Prove that sum of internal bisectors and external bisectors of ∠B and ∠C of ΔABC are supplementary.

12)In ΔPQR , PS is bisector of ∠P and PT⊥ QR , Prove that $\angle TPS = \frac{1}{2}(\angle Q - \angle R)$

CHAPTER-7 TRIANGLES

SECTION-A(1 MARKS)

1).Two sides of a triangle are say 4cm and 1.5 cm. what can never be length of the third side.

2).If a triangle ABC is congruent to triangle DEF by SSS congruence condition then find the corresponding angles.

3).In triangles ABC, if AB=AC, ∠ B =50^0 , then find the ∠ A .

4).In Δ ABC & Δ DEF, AB = DE, ∠ A = ∠ D. find the third condition for congruency of SAS

5).In Δ PQR ,QR=PQ and ∠ Q=40^0 , then find ∠ P?

6)If a perpendicular dropped from a vertex of

SECTION-B(2 MARKS)

1).Prove that angles opposite to equal sides of a triangle are equal.

2).Prove that each angle of an equilateral triangles is 60^0.

3).In a triangleABC and trianglePQR ,∠ A=∠P, ∠ B=∠Q and AB=QR. Will the two triangles be congruent? Give reasons for your answer.

4).ABC is a right angled triangle in which ∠ B =90^0 and AB=BC.
Find angle A and C.

5).S is any point on side QR of a triangle PQR. Show that PQ+QR+RP>2PS.

SECTION-C(3 MARKS)

1)Show that in a quadrilateral ABCD,AB+BC+CD+DA>AC+BD.

2).Prove that in an isosceles triangle the altitude from vertex bisects the base.

3).Eand F are respectively the mid points of equal sides AB and AC of a Δ ABC. Show that BF=CE

4). Is it possible to construct a triangle with lengths 5.4cm,6.6cm,and 13 cm. give reasons

5).The side BC of a triangle ABC is produced on both sides, prove that sum of two exterior angles so formed is greater than angle A by 180.

SECTION-D(4 MARKS)

1).BE and CF are two equal altitudes of a triangle ABC. Using RHS congruence rule , prove that triangle is isosceles.

2).If two isosceles triangles have a common base, prove that line joining the vertices bisects the base at right angle.

3).A triangle ABC is right angled at A. AL is drawn perpendicular to BC. Prove that ∠ BAL= ∠ACB.

4).Triangle ABC is an isoscelestriangle in which AB=AC. Side BA is produced to D. such that AD=AB. Show that ∠ BCD is a right angle.
5)If the bisector of an angle of a triangle bisects the opposite side,prove the triangle is isosceles.

CHAPTER-8 QUADRILATERALS

SECTION-A(1 MARKS)

1.Name a quadrilateral whose diagonals bisect each other at right angle.

2.Find value of x in given figure. 

4.In a parallelogram ABCD, E and F are the mid points of side AB and CD respectively.

AF and CE meet the diagonals BD of length 12 cm at P and Q. Find the length of PQ.

5.A triangle ABC, right angled at B. side AB=6 CM and side BC=8 cm. D is the mid-point

of AC. Then find length of BD.

6.1 A quadrilateral whose diagonals bisect at right angle is called _____

7. In a parallelogram if ∠ A is 850 then what is the value of ∠ B +∠ D

8.In trapezium ABCD AB // CD and AD =BC . If ∠ D = 70^0 then find ∠C
9.Two angle of quadrilateral are 50^0 and 80^0 and other two angle are in the ratio 8 :15.

Then find the remaining two angles.

10.ABCD is a rhombus such that∠ ACB = 40^0 find ∠ADB

SECTION-B(2 MARKS)

1. In a parallelogram ABCD,$\angle D = 105°$, determine the angles $\angle A and \angle c$
2. In a parallelogram PQRS, diagonals PR and QS intersect at O and PR=6.4 cm and QS=5.8 cm. Find the measurement of OP and OQ.
3. ABCD is a rectangle with $\angle BAC = 42°$. determine $\angle DBC$.
4. PQRS is a rhombus with $\angle PQR = 58°$. Determine $\angle PRS$.
5. The angles of a quadrilateral are in ratio 3 : 5 : 9 : 13. Find the angles of quadrilateral.
6. ABCD is a parallelogram and X and Y are the midpoint of AB and CD .Prove that AXCY is a parallelogram.
7. In parallelogram ABCD, equal diagonals AC and BD intersect at P, such that AP =PC and BP = PD , also ∠BPC= 90^0 , what can you say ABCD.?
8. PQRS is a rhombus with∠ PQR = 58^0 . Determine ∠ PRS
9. ABC is aright triangle right angle at B . Side AB =6cm BC = 8cm . If D is the mid point of AC find BD.
10. In parallelogram ABCD , E and F are the midpoint of side AB and CD. AF and CE meets diagonal BD of length 12cm at P and Q. Find PQ.

SECTION-C(3 MARKS)

1. Show that the quadrilateral formed by joining the mid-points of consecutive sides of a rectangle is a rhombus.
2. In a parallelogram ABCD, the bisectors of adjacent angles A and B intersect each other at P. prove that $\angle APB = 90°$
3. A parallelogram of sides 60 cm and 25 cm has a diagonal of length 65 cm. find the altitude to the side having a length of 25 cm.
4. ABCD is a rectangle is which diagonal AC bisects $\angle A and \angle C$. Prove that ABCD is a square.
5. If non-parallel sides of trapezium are equal then prove that its cyclic.
6. . P Q and R are the respectively the mid points of sides BC, CA and AB of a triangle ABC. PR and BQ meet at X and PQ and CR meet at Y. Prove that XY = ¼BC.
7. A parallelogram of sside 60cm and 25 cm has the diagonal of length 65cm.Find the length of altitude to the side of length 35cm.
8. ABCD is a trapezium with AB ‖ CD. M and N are the midpoint of side AD and BC respectively. If AB =12cm and MN = 14CM , find CD.
9. 14. In parallelogram ABCD , E and F are mid points of side AB and CD. Prove that AF and CE trisect diagonal BD.
10. ABCD is a rectangle in which diagonal AC bisect∠A and∠ C . Prove that ABCD is square.

SECTION-D(4 MARKS)

1. Show that the quadrilateral formed by joining the mid-points of the sides of a square, is also a square.

2. Prove that the diagonals of a square are equal and perpendicular to each other.
3. Prove that in a triangle, the line segment joining the mid-points of any two sides is parallel to third side and is half of it.
4. The angles of a quadrilateral are in ratio 1 : 2 : 3 : 4. Find all four angles of quadrilateral.
5. Show that the four triangles formed by joining the mid-points of the three sides of a triangle are congruent to each other.
6. If the non parallel sides of a trapezium are equal then prove that it is cyclic.
7. Prove that diagonal of square are equal and perpendicular to each other.
8. Prove that the line segment joining the midpoint of any two sides of a triangle is parallel to the third side and half of it.
9. ABCD is a quadrilateral in which AB ‖ CD and AD = BC Prove that $\angle A = \angle B$ and $\angle C = \angle D$
10. . E is the mid point of median AD of triangle ABC AND BE is produced to meet AC at F . Prove that AF = 1/3 AC.

AREAS OF PARALLELOGRAMS AND TRIANGLES

CHAPTER – 9

SECTION- A(1 mark)

1) In ΔABC ,AD is median , if area of ΔABC is 35cm^2, find area of ΔABD.
2) Area of a parallelogram ABCD is 40 cm^2.What will be the area of the triangle PDC formed by taking a point P on A ?
3) The area of a trapezium is 48cm^2,the distance between parallel sides is 6cm.If one of the parallel sides is 4cm,find the other parallel side.
4) E is the midpoint of median AD of triangle ABC, If ar(ΔABC) is 40cm^2,find the ar(ΔAED).
5) In parallelogram ABCD ,AB = 10cm and altitudes corresponding to the sides AB and AD are 7cm and 8cmrespectively. Find AD.

SECTION- B(2 marks)

1.If E is a point on the median of ΔABC, then show that ar(ΔABE) = ar(ΔACE).

2.Show that the diagonals of a parallel divide it in four triangles of equal area.

3.Show that median of a triangle divides it into triangles of equal area.

4.ABCD is a quadrilateral and its diagonals AC and BD intersect each other at o.

If BO =DO,then prove that ΔABC andΔADC are equal in area.

5.ΔABC and ΔABD are on the common base AB. Line segment CD is bisected by AB at

O. Show that both the triangles are equal in area.

SECTION – C(3 marks)

1)Point P and Q are on the sides DC and AD of a parallelogram respectively . Show that ar(ΔAPB) = ar (ΔBQC)

2)Show that the diagonals of a parallelogram divide it into four triangles of equal area.

3)XY is a line to side BC of a triangle ABC.If BE //AC and CF//AB meet XY at E and F respectively.Prove that ar(ABE) = ar (ACF)

4)Parallelogram ABCD and rectangle ABEF are on the same base and have equal areas. Show that perimeter of the parallelogram is greater than that of rectangle

5)ABCD is a quadrilateral and BE //AC is such that BE meets at E on the extended side DC. Show that area of triangle ADE is equal to the area of quadrilateral ABCD.

6.ABCD is a parallelogram and BC is produced to a point Q such that AD =CQ. If AQ intersects DC at P,Show thatar (ΔBPC) = ar (ΔDPQ).

7.ΔABC and ΔDBC are on the common base BCand their vertices A and D lie on the opposite sides of BC so that ar (ΔABC) = ar (ΔBCD).Show that line segment BC bisects AD.

8.In ΔABC, D is the midpoint of the side AB. P is any point on BC.CQ is parallel to PD and intersects AB at Q.Prove that ar (ΔBPQ) =$\frac{1}{2}$ar (ΔABC).

9.ABCD is atrapezium in which AB is parallel to CD,DC =30cm and AB= 50cm, if X and Y are respectively the midpoints of AD and BC .Prove that ar(DCYX) = $\frac{7}{9}$ar(XYBA).

10.The side AB of a parallelogram ABCD is produced to any point P. A line through A parallel to CP meets CB produced in Q and the parallelogram PBQR is formed. Show that ar(ABCD) = ar(BPQR)

SECTION – D(4 marks)

1. AB and CD are parallel sides of trapezium ABCD. Diagonals AC and BD intersect at O. prove that ar(ΔAOD) = ar(ΔBOC).

2. If D is the mid .point of side of side BC of a ΔABC, P and Q are two points lying respectively on the sides AB and BC such that DP is parallel to QA. Prove that

ar(ΔCQP) = 1/2 ar(ΔABC).

3. A rectangle is formed by joining the mid-points of the sides of a rhombus. Show that the area of rectangle is half the area of rhombus.

4. In a parallelogram ABCD, AE is perpendicular to DC and CF is perpendicular to AD. If AB = 10 cm, AE = 6 cm and CF = 8 cm, then find AD.

5. The adjacent sides of a rectangle are 16 cm and 8 cm. Find the area of the rectangle.

6. PQRS is a square. T and U are the mid-points of sides PS and QR respectively. Find the area of ΔOTS, if PQ= 8 cm, where O is the point of intersection of TU and OS.

7. If two sides of one triangle are equal to two sides of another triangle and the contained angles are supplementary, show that the two sides are equal in area.

8. In a trapezium ABCD where AB is parallel to CD, E is the mid-point of BC, prove that ΔAED = 1/2 trapezium ABCD.

9. The area of triangle ABC is 15 cm sq. If ΔABC and a parallelogram ABPD are on the same base and between the same parallel lines then what is the area of parallelogram ABPD.

10. The area of parallelogram PQRS is 88 cm sq. A perpendicular from S is drawn to intersect PQ at M. If SM = 8 cm, then find the length of PQ.

CIRCLES
CHAPTER -10

Section-A(1mark)

1) two concentric circles with centers O. a line cuts the circles at A, B, C, D respectively if AB =10 cm then find CD.
2) How many circles can be drawn through three non collinear points.
3) A point C is on the line AB.Can a circle through A,B,C be drawn.
4) How many circles can be drawn passing through two points.
5) What is that circle which passes through three vertices of any triangle?
6) How many circles can be drawn through threethree vertices A,B & C of a triangle.
7) Length of of the chord of a circle is equal to its radius, find the angle subtended by this chord at the centre of the circle.
8) The minimum distance of 8cm long chord from the centre is 3 cm, find the diameter of the circle.
9) If in a circle arc AB = 6cm, arc CD = 6cm and ∠AOB = 65^0,then find ∠COD ,where O is the centre of the circle.
10) If in a circle arcAB = 9 cm ,arc CD = 4.5 cm ,∠AOB = 80^0,then find ∠COD, where O is the centre of the circle.

Section B(2 marks)

1) Prove that the circle drawn on any equal side of an isosceles triangle as diameter bisects the base
2) Two circles are drawn with sides AB and AC of a triangle ABC as diameters. The circles intersect at a point D. if AB=5 cm, BD=3cm,AC=6cm. then find BC.
3) ABC is a triangle inscribed in a circle with centre O. if $\angle AOC = 130° \; and \; \angle BOC = 150°, find \; \angle ACB$.
4) Find the length of cord which is at a distance of 4 cm from the centre of circle whose radius is 5 cm.
5) Prove that a cyclic parallelogram is always rectangle.
6) AB and CD are two parallel chords of lengths 5 cm ,11 cm respectively of a circle. If distance between the chords be 3 cm, then find the radius of the circle.
7) In any cyclic quadrilateral opposite angles are in the ratio 4 : 5 ,then find the angle s in degree.
8) Prove that ,if one side of a cyclic quadrilateral is produced, then the exterior angle is equal to the opposite interior angle.
9) A chord of a circle is equal to the radius of the circle. Find the angle subtended by the chord at a point on the minor arc and also major arcs of the circle.
10) Prove that circle drawn with any side of rhombus as diameter, passes throughthe intersection of the diagonals of the rhombus.

Section C(3marks)

1) Prove that the quadrilateral formed by angle bisector of cyclic quadrilateral is always cyclic.
2) If two non-parallel sides of a trapezium are equal prove that its cyclic.
3) Prove that sum of either pair of opposite angles of a cyclic quadrilateral is 180°.
4) If two circles intersect at two point , prove that their centres lies on the perpendicular bisector of the common chord.
5) Bisector of angles A,B and C of a triangle ABC intersects its circumcentre at D,Eand F respectively. Prove that angles of triangle DEF are $90^0 - \frac{\angle A}{2}$, $90^0 - \frac{\angle B}{2}$ and $90^0 - \frac{\angle C}{2}$
6) If circles are drawn taking two sides of a triangle as diameters,Prove that the point of intersection of these circle lies on the third sides.
7) ABCD is cyclic quadrilateral . Bisectors of opposite angles A and C intersect the circle at point E and F respectively.Prove EF is the diameter of the circle.

Section D(4marks)

1) Prove that the degree measure of an arc of a circle is twice the angle subtended by it at any point of the alternate segment of circle with respect to the arc.
2) Two circles intersect at P and Q. through P, two straight lines APB and CPD are drawn to meet the circle at A, B, C and D and DB when produced meet at O. show that OAQB is a cyclic quadrilateral.
3) ABCD is a parallelogram. The circle through A, B, C intersect CD produced at E. if AB = 10 cm, BC=8 cm, CE=14 cm. find AE
4) Two equal chords AB and CD of a circle when produced intersect at a point P. prove that PB= PD
5) Prove that angle bisector of any angle of a triangle and perpendicular bisector of the opposite side if intersect, they will intersect on the circumcircle of triangle.
6) Prove that the quadrilateral formed by the internal angle bisectors of any quadrilateral is cyclic.

CONSTRUCTION

CHAPTER- 11

Section B(2marks)

1. Construct a triangle ABC in which three sides are in ratio 1:3:5 and its perimeter is 13.5 cm.
2. Construct a triangle ABC if its perimeter is 10.4 cm and base angle is 45° and 120°.
3. Construct a triangle ABC with perimeter 12 cm, $\angle A = 45° \; and \; \angle B = 30°$.
4. By using compass and ruler draw an angle of 60°and bisect it.
5. Construct a triangle ABC such that $\angle Y = 30°, \angle Z = 90°$ and XY+YZ+ZX=11 cm.
1. Construct a triangle ABC such that $\angle B = 60°, \angle c = 45°$ and AB+BC+CA=10 cm.
2. Construct a triangle ABC in which$\angle B = 55°, BC = 6 \; cm \; amd \; AB - AC = 4cm$
3. Construct a triangle DEF whose perimeter is 11 cm and $\angle E = \angle F = 45°$
4. Without using protractor draw an angle of 135°
5. Construct a right angled triangle whose base is 12 cm and sum of its hypotenuse and other side is 18 cm.

Section C(3marks)

1. Construct a triangle with perimeter 10 cm and base angle 60° and 45°. Write steps of construction.
2. Construct an equilateral triangle whose altitude is 3.5 cm
3. Construct a triangle ABC in which $\angle A = 45°, \angle B = 60°$ and altitude CD=5cm

4. Construct a triangle PQR in which RP=5 cm, QR=4.5 cm and altitude RM =3.5.
5. Construct a triangle with base length 5 cm, the sum of other two sides is 7 cm and one base angle is 60°

Section D(4marks)

1. Construct a rectangle whose adjacent sides are of length 5 cm and 3.5 cm
2. Construct a triangle if its perimeter is 10.4 cm and two angles are $45^o$and 120^o and give justification.
3. Construct a triangle, if its altitude is 3.2 cm
4. A rhombus whose diagonals are 4 cm and 6 cm in lengths
5. A right triangle when one side is 3.5 cm and sum of other sides and hypotenuse is 5.5 cm

HERON'S FORMULA

CHAPTER - 12

SECTION –A(1mark)

1)How many m^2 are there in 1 hectare ?

2)The area of a triangle is 30cm^2. Find the base, if the altitude exceeds the base by 7 cm.

3)The base of an isosceles triangle is 10cm and each of its equal sides is 13 cm .

Find its area.

4)The perimeter of an equilateral triangle measures $\sqrt{3}$ times as the area of the equilateral triangle. Find the length of each side.

5)If the diagonal of a square field is 40 m ,find the area of square.

6)If each side of an equilateral triangle become double.How much per cent will the area Increase?

7)If each side of a triangle is halved,find how much per cent is its perimeter decreased?

8)The perimeter of a square is (4x + 200, find its diagonal.

9)The hypotenuse of a right angled isosceles triangle is $16\sqrt{2}$ m,find its area.

10)The perimeter of an equilateral triangle is 36 cm, then find the area of the triangle.

SECTION – C(3marks)

1)The sides of a triangular park are in the ratio 5: 12 : 13 and perimeter of triangle is 120 m. Find the area of the triangular park.

2)parallel sides of a trapezium are 28 m and 23 m. One of the remaining sides is 13 m and other side is perpendicular on the parallel sides. Find the area of the trapezium.

3)The perimeter of a rhombus is 52 cm. One of the diagonal is 24 cm.Find the area of the rhombus and length of other diagonal.

4)The adjacent side of a parallelogram are 26 cm and 28 cm and one of its diagonal is 30 cm.find the area of parallelogram.

5)A garden is in the shape of a quadrilateral.The sides of the garden are 9 m,40 m,28 m and 15 m ,respectivelyin consecutive order and the angle between first two sides is a right angle. Find area of the garden.

6.An isosceles triangle has perimeter 40 cm and each of equal side is 15 cm. Find the area of triangle and length of altitude of the triangle corresponding to the one of its equal sides.

7)In a trapezium, two parallel sides are 25 cm and 13 cm and non parallel sides are 10 cm and 13 cm. Find the area of trapezium .

8)one side of an equilateral triangle is $8\sqrt{3}$ cm, then find the length of the perpendicular drawn from any vertex on the opposite side.

9)The perimeter of a right angled triangle is 12cm and its hypotenuse is 5 cm. Find the length of other two sides and rea of the triangle.

10)A triangle and a parallelogramhave the same base and same area. If the sidesof the triangle are26 cm, 28 cm and 30 cmrespectively and the parallelogram stands on the

base 28 cm, find the height of the parallelogram.

SECTION –D(4marks)

1)the school of a city is going to start “QUICK SMOKING” campaign.Some of the students have been asked to prepare triangular shaped banners.The side of triangular shaped banner are in the ratio of 14 : 15 : 13 and perimeter is 168 cm.

i) Find its area.

ii)Find the cost of banner at the rate of ₹ 12 per sq.cm.

iii)Which value is shown by the student?

2)ABCD is a trapezium in which AB // CD, BC and AD are non-parallel sides. It is given that

AB = 25 cm, BC = 10 cm, CD = 13 cm and AD = 13 cm .Find the area of the trapezium.

3)Find the area of quadrilateral ABCD whose sides are 5 m,12m ,15 m and 14 m and angle between first two sides is 90^0.

SURFACE AREAS AND VOLUMES

CHAPTER -13

Section A(mark)

1) How do we judge whether the object is solid or not?
2) Find Lateral surface area of cuboid with dimensions l, b, and h?
3) A cylindrical cake of maximum volume is to be cut out of a cube cake of side 4cm then find maximum Volume of cake?
4) A circus pandal is 240 m in radius and its height is 100 m. Then the length of cloth used to make pandal when width of cloth is 100 πm
5) Find lateral as well as total surface area of cube with edge 20 cm

Section B(2marks)

1) The area of the volume of cylinder is 448 $\pi\ cm^3$ and height is 7 cm find T.S.A
2) Find the volume and surface area of sphere of radius 4.3 cm

3) The cone and hemispheres have equal bases and equal volumes. Find ratio of their heights.
4) a rectangular water tank of base 11 m x 6 m contains water up to a height of 5 m. if the water in the tank is transferred to a cylindrical tank of radius 3.5 m, find how high the water level in tank.
5) A river3 m deep and 40 m wide is flowing at the rate of 2 km per hour. How much water will fall into sea in a minute?

Section C(3marks)

1) There are two cones. The C.S.A of one is twice that of other. The slant height of latter is twice than that of former. Find radius of their height
2) An iron pipe 20 cm long has exterior diameter equal to 25 cm. if thickness of pipe is 1 cm, find the whole surface area of pipe.
3) A hemisphere of lead of radius 7 cm is casted into a right circular cone of height 49 cm. find the radius of base of cone.
4) Radius of cone is 5 cm and height is 12 cm. find the C.S.A and volume of cone.
5) Two cubes have volume in the ratio 27:64. Find the ratio of their surface area.

Section D(4marks)

1) If height of two cones are in ratio 1:3 and their diameters are in the ratio 3:5, find ratio of their volumes.
2) If each edge of cube is increased by 25%, then find the percentage increased in its surface area.
3) If the volume of sphere is divided by its surface area, the result is 27 cm. find diameter of sphere.
4) A cube of side 4 cm contain in a sphere touching its sides. Find volume of gap between them
5) A semi-circular sheet of metal of diameter 28 cm is bent to form an open conical cup. Find capacity of cup.

STATISTICS

CHAPTER -14

Section A(1mark)

1. A data is such that its minimum value is 86 a range is 32, and then finds the maximum value.
2. Find class mark of the class 70-80.
3. Find mode of the data 4,6,9,6,4,2,4,8,6,43,4,6.

4. Find the mean of prime numbers between 20-30.
5. Median of data 32, 15, 27,8,15,12,9.

Section B(2marks)

1. The mean of 16 numbers is 8. If 2 are added to every number, what will be the new mean?
2. determine the median of 24,23,a,a−1,12,16 where a is the mean of 10,20,30,40,50.
3. The mean of 10,12,18,13,p and 17 is 15,find p
4. Draw ogive for the following distribution table

CLAS INTERVAL	FREQUENCY
0-10	10
10-20	5
20-30	8
30-40	6
40-50	6
50-60	4

5. Find mean of following frequency distribution

X	**4**	**6**	**9**	**10**	**15**
F	5	10	10	7	**8**

Section –C(3marks)

1) Construct a c.f. table for following data

CLASS INTERVAL	FREQUENCY
04 --- 07	03
08 --- 11	10
12 --- 15	12
16 --- 19	08
20 --- 23	05
24 --- 27	09

2) Find the arithmetic mean of first ten natural numbers.
3) Find the arithmetic mean of first five odd positive integers.
4) Find mode of following data.

7, 9, 12, 13, 7, 12, 15, 7, 12, 7, 25, 18, 7.

5) Find the combined mean of a group of 150 students if the mean of 50 students is 40 and that of other 100 students is 50.

Section D(4marks)

1) Draw a histogram and frequency polygon for the following data

Class interval	Frequency

00----50	12
51----100	18
101----150	27
151----200	20
201----250	17
251----300	06

2) Find mean , median, mode for the following data

78, 56, 22, 34, 45, 54, 39, 68, 54, 84

3) Find the length of longest rod that can be placed In a room 30 m long, 24 m broad and 18 m high
4) The mean of 25 observations is 18. The mean of first twelve of them is 14 and that of last twelve is 17. Find the thirteenth result.
5) A team of 8 persons join in shooting competition. The best marksman scored 85 points. If he had scored 92 points the average score of the team would have been 87. Find total number of points scored by the team.

PROBABILITY

CHAPTER - 15

Section A(1mark)

1. In a class of 50 students there are 120% boys, then find the number of boys in class.
2. The probability of selecting a boy in a class is0.6 and there are 45 students in a class, then find the number of girls in the class.
3. In a class there are x boys and y girls, a student is selected at random, and then find the probability of selecting a girl.
4. A dice is thrown once, a number is noted, and then find the probability that it is a prime number.
5. The probability of happening of an event is 37%. Then find the probability of the event.

Section B(2marks)

1. A coin is tossed 15 times and observed that 11 times head comes up. Find the probability of getting a tail.
2. A die is thrown. Find the probability of getting an odd number.

3. Two dice are thrown simultaneously find the probability of getting an even prime number.
4. Two coins are tossed simultaneously by 300 times and we get two heads:135; one head:63; no head : 102
5. Find the probability of occurrence of each of these events.

Section C(3marks)

1. A die is thrown 500 times with the frequencies for the outcomes 1, 2, 3, 4, 5, 6 as given in following table.

outcomes	01	02	03	04	05	06
frequencies	80	75	90	75	85	95

2. The king queen and jack of clubs are removed from a deck of well shuffled cards. One card is selected from the remaining card. Find the probability of getting
   (a) A heart (b) a king (c) the 10 of hearts.

3) A die is thrown 100 times and the data is recorded as below:

Outcomes	01	02	03	04	05	6
frequency	20	15	20	15	20	10

(a) What is the probability that we get an even number?
(b) What is the probability of getting a number less than 3?

4) 1500 Families with 2 children were selected randomly and the following data were recorded:

Number of girls in family	02	01	00
Number of families	475	814	211

Compute the probability of having

(a) A two girls
(b) One girl
(c) No girl
(d) Find the sum of these probability

5) A die is thrown 400 times, the frequency of outcomes 1, 2, 3, 4, 5 and 6 are noted in frequency distribution table given below:

outcomes	01	02	03	04	05	06
frequency	75	60	65	70	68	62

Section D(4MARKS)

1. A recent survey found the ages of workers in factory as follows.

Age	20-29	30-39	40-49	50-59	60 and above
Number of workers	38	27	86	46	03

If a person is selected at random, find the probability that person is

1. 4o year or more
2. Under 40 year
3. Having age between 30-39 year
4. Under 60 but over 39 year.

2. If the dice is thrown thrice what is the probability of getting a sum
   A. 3?
   B. More than 10?
   C. Less than or equal to 5?
   D. Between 8 and 12?
3. In a medical examination of students of class, the following blood groups are recorded.

Blood group	A	AB	B	O

Number of students	10	13	12	5

If a student is selected at random find the probability that he/she has blood group

a) A b) AB c) B d)O

4. A die is thrown 100 times and the data is recorded as below:

Outcomes	01	02	03	04	05	6
frequency	20	15	20	15	20	10

Find the probability of getting A odd number

a) An even prime
b) A multiple of 2
c) A factor of 6

5. The king queen and jack of diamonds are removed from a deck of well shuffled cards. One card is selected from the remaining card. Find the probability of getting

a) A heart (b) a red king (c) the 10 of hearts d)a black queen