

All questions are compulsory

Section A

- Q1 The arithmetic mean and mode of a data are 24 and 12 respectively, then find the median of the data.
- Q2 Find irrational numbers between 3 and 7.
- Q3 Find the angle which is four times its supplement.
- Q4 Find the mirror image of the point $(-1, 2)$ on y-axis.
- Q5 If the volume and surface area of a sphere are numerically equal then find the radius of the sphere.
- Q6 Find the value of p for which the polynomial $4x^4 + 2x^3 - 3x^2 - px - 28$ has -2 as its zero. **(1x6=6)**

Section B

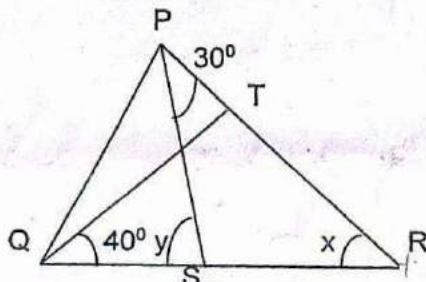
- Q7 The edges of a triangular board are 6 cm, 8 cm and 10 cm. Find the cost of painting it at the rate of rupees 0.20 per cm^2 .
- Q8 Show that equal chords of a circle subtend equal angles at the centre.
- Q9 If a point C lies between two points A and B such that $AC = BC$, then prove that $AC = \frac{1}{2} AB$.
Explain by drawing the figure.
- Q10 P and Q are any two points lying on the sides DC and AD respectively of a parallelogram ABCD. show that $\text{ar}(APB) = \text{ar}(BQC)$.
- Q11 XY is a line parallel to side BC of a triangle ABC. If BE is parallel to AC and CF is parallel to AB meet XY at E and F respectively. Show that $\text{ar}(ABE) = \text{ar}(ACF)$.
- Q12 Show that $p-1$ is a factor of $p^{10} + p^8 + p^6 - p^4 - p^2 - 1$. **(2x6=12)**

Section C

- Q13 Find the value of K if $x = 2$, $y = 1$ is a solution of the equation $2x + 3y = K$. Hence find two more solutions of the equation.
- Q14 Find the volume of a sphere whose surface area is 154 cm^2 .
- Q15 Simplify $\sqrt{125} - 4\sqrt{6} + \sqrt{294} - 2\sqrt{\frac{1}{6}}$.
- Q16 Find the area of the triangle whose perimeter is 180 cm and two of its sides are of length 80 cm and 18 cm. Also calculate the altitude of the triangle corresponding to the shortest side.
- Q17 Find the value of p , if the mean of the following distribution is 7.5

X	3	5	7	9	11	13
F	6	8	15	p	8	4

- Q18 In the given figure, if QT is perpendicular to PR, $\angle TQR = 40^\circ$ and $\angle SPR = 30^\circ$ find x and y



Q19 Mark the points $(2, 2)$; $(2, -2)$; $(-2, -2)$ and $(-2, 2)$ on a graph paper and join these points . name the figure obtained . Also find the area of the figure so obtained .

Q20 Factorise : $4x^2 + y^2 + 25z^2 + 4xy - 10yz - 20zx$ and hence find its value when $x = -1$ $y = 2$ and $z = -3$.

Q21 Draw a histogram of the weekly pocket expenses of 125 students of a school given below :

Weekly pocket expenses (in rupees)	0- 10	10 -20	20 -30	30 - 40	40 -50	50 -60
Number of students	10	20	10	15	30	40

Q22 Fifty seeds were selected at random from each of 5 bags A, B, C, D, E of seeds, and were kept under standardised conditions equally favourable to germination . After 20 days, the number of seeds which had germinated in each collection were counted and recorded as follow :

Bag	A	B	C	D	E
Number of seeds germinated	40	48	42	39	41

What is the probability of germination of

- (i) More than 40 seeds in a bag ?
- (ii) 49 seeds in a bag ?
- (iii) More than 35 seeds in a bag ? .

(3x10=30)

Section D

Q23 Sketch the graph of the equation $3x + 5y = 15$. Find the area of the figure formed by this line and the two axes .

Q24 Construct a ΔABC in which $\angle B = 60^\circ$, $\angle C = 45^\circ$ and $AB + BC + CA = 11$ cm .

Q25 Show that the line segments joining the midpoints of the opposite sides of a quadrilateral bisect each other .



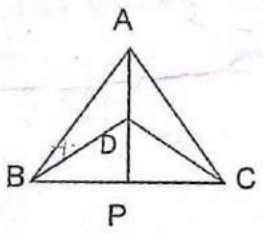
Q26 Prove that an angle subtended by an arc at the centre is double than the angle subtended by it at any point on the circumference of the circle .

Q27 Simplify : $\frac{7+3\sqrt{5}}{3+\sqrt{5}} - \frac{7-3\sqrt{5}}{3-\sqrt{5}}$ *ans 2*

Q28 Find a and b so that the polynomial $x^3 - 10x^2 + ax + b$ is exactly divisible by the polynomial $(x - 1)$ and $(x - 2)$.

Q29 ΔABC and ΔDBC are two isosceles triangles on the same base BC and vertices A and D are on the same side of BC . If AD is extended to intersect BC at P, show that

- (i) $\Delta ABD \cong \Delta ACD$
- (ii) $\Delta ABP \cong \Delta ACP$
- (iii) AP bisects $\angle A$ as well as $\angle D$.
- (iv) AP is the perpendicular bisector of BC.



Q30 A metal pipe is 77 cm long . The inner diameter of a cross section is 4 cm , the outer diameter being 4.4 cm . Find its

- (i) Inner curved surface area
- (ii) Outer curved surface area
- (iii) Total surface area *11* ?

(4x8=32)