

All questions are compulsory:

Q14

a) Sandeep purchased a digital camera for ₹ 25488, which includes 10% rebate on the list price and 18% tax (Under GST) on the remaining price. Find the marked price of the digital camera. $\angle 3$

b) Mohan has a recurring deposit account in a bank for 2 yr at 6% per annum simple interest. If he gets ₹ 1200 as interest at the time of maturity, then find
i) the monthly instalment ii) the amount of maturity $\angle 3$

c) Mr. Samuel invested ₹ 8000 in 7% ₹ 100 shares at ₹ 80. After a year, he sold these shares at ₹ 75 each and invested the proceeds in 18% at ₹ 25 shares at ₹ 41.

Find
i) his dividends for the first year.
ii) his annual income from the second investment.
iii) the percentage of increase in return on his original investment. $\angle 4$

Q15 a) Find the value of 'k', if $4x^3 - 2x^2 + kx + 5$ leaves remainder -10 when divided by $2x+1$ $\angle 3$

b) Find the 26th term of the A.P 7, 11, 15, 19, ... $\angle 3$
Find the sum of the first 6 terms.

c) A solid cylinder of radius 7cm and height 14cm is melted and recast into solid spheres each of radius 3.5cm. Find the number of spheres formed. $\angle 4$

Q3) a) Prove the identity:

∠3

$$\frac{\sec A}{\sec A - 1} + \frac{\sec A}{\sec A + 1} = 2 \operatorname{cosec}^2 A$$

b) Using factor theorem, show that $(x-2)$ is a factor of $x^3 + x^2 - 4x - 4$.

∠3

c) Using ruler and compasses only:

∠4

i) Construct $\triangle ABC$, having given $BC = 7\text{cm}$, $AB - AC = 1\text{cm}$ and $\angle ABC = 45^\circ$.

ii) Inscribe a circle in the $\triangle ABC$ constructed above.

Q4)

a) The angle of elevation of the top of an unfinished tower at a point distance 80m from its base is 30° . How much higher must the tower be raised so that its angle of elevation at the same point may be 60° ?

∠3

b) The total number of observations in the following table is 120 and their mean is 50. Find the values of missing frequencies f_1 and f_2 .

∠3

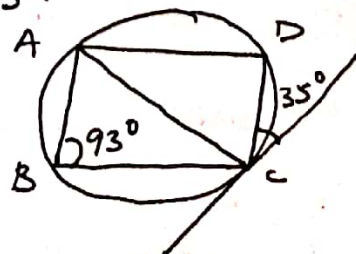
Class	0-20	20-40	40-60	60-80	80-100
Freq.	17	f_1	32	f_2	19

c) In the given fig, CE is a tangent to the circle at point C. ABCD is a cyclic quadrilateral.

If $\angle ABC = 93^\circ$, $\angle DCE = 35^\circ$

Find i) $\angle ADC$ ii) $\angle CAD$

iii) $\angle ACD$.

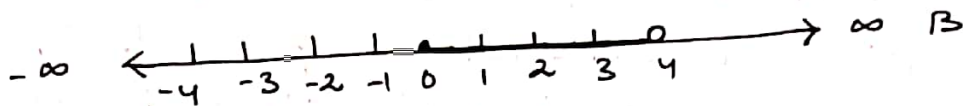
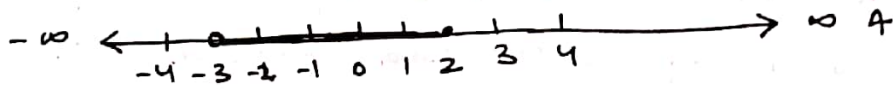


SECTION B

4X10 = 40 Marks

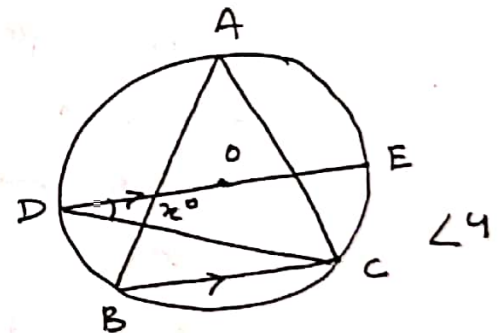
Answer any 4 questions.

- Q57 a) The two number lines are shown for A and B on the real number line: /3



- b) If the image of the point $(2, 1)$ with respect to the line mirror be $(5, 2)$, then find the equation of the mirror. /3
- c) Find the values of a and b so that the polynomial $(x^3 - 10x^2 + ax + b)$ is exactly divisible by $(x-1)$ as well as $(x-2)$. /4

- Q64 a) In the given fig. $BC \parallel DE$ and O is the centre of the circle. If $\angle CDE = x^\circ$; find in terms of x° , the value of $\angle BAC$. /4



- b) The fourth term of an A.P is 11 and the eighth term exceeds twice the fourth term by 5. Find the A.P and sum of first 50 terms. /3

- c) If $M = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$ and I is a unit matrix of the same order as that of M ; show that: $M^2 = 2M + 3I$.

Q77 a) If q is the mean proportional between p and r , prove that: L3

$$p^2 - q^2 + r^2 = q^4 \left(\frac{1}{p^2} - \frac{1}{q^2} + \frac{1}{r^2} \right)$$

b) Sahil had 1000 shares of a company with a face value of ₹ 40 and paying 8% dividend. He sold some of these shares at a discount of 10% and invested the proceeds in ₹ 20 shares at a premium of 50% and paying 12% dividend. If the change in his income is ₹ 192, find the number of shares sold by Sahil. L4

c) One pipe can fill a cistern in 3 hours less than the other. The two pipes together can fill the cistern in 6 hours 40 minutes. Find the time that each pipe will take to fill the cistern. L3

Q87

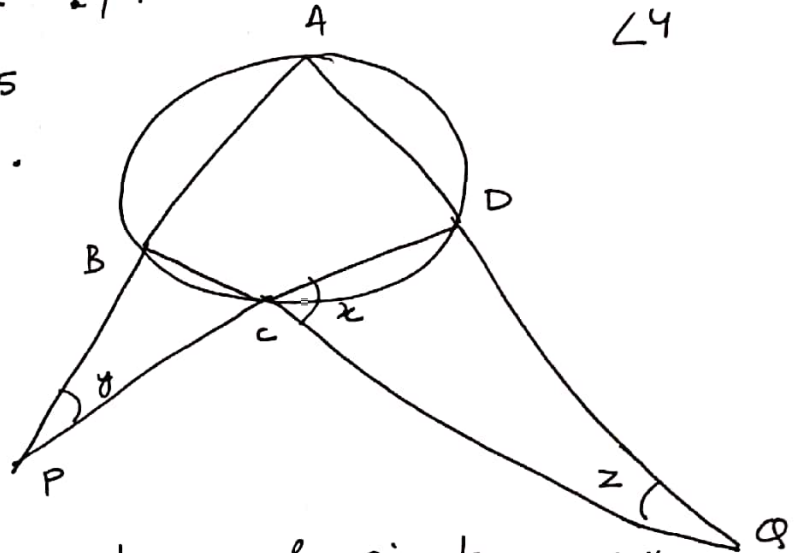
a) The fourth term, the seventh term and the last term of a geometric progression are 10, 80 and 2560 respectively. Find its first term, common ratio and number of terms. L3

b) M is the mid-point of the line segment joining the points $A(-3, 7)$ and $B(9, -1)$. Find the co-ordinates of point M . Further, if $R(2, 2)$ divides the line segment joining M and the origin in the ratio $P:Q$, find the ratio $P:Q$. L4

c) Show that the points $P(a, b+c)$, $Q(b, c+a)$ and $R(c, a+b)$ are collinear. L3

Q99 a) Through the mid-point M of the side CD of a parallelogram ABCD, the line BM is drawn intersecting diagonal AC in L and BD produced in E. Prove that: $EL = 2BL$. L4

b) Cal. x, y and z if:
 $x/3 = y/4 = z/5$



c) P and Q are centres of circles with radii 9cm and 2cm respectively. $PQ = 17$ cm. R is the centre of a circle of radius x cm, which touches the above circles externally. Given that $\angle PRQ = 90^\circ$.

Q107 a) The capacity and the base area of a right circular conical vessel are 9856 cm^3 and 616 cm^2 respectively. Find the curved surface area. L3

b)
$$\frac{\cos A}{1 - \tan A} + \frac{\sin A}{1 - \cot A} = \cos A + \sin A$$
 L3

c) The following numbers are written in descending order of their values: L2
 $68, 60, 52, x-3, x-8, x-11, 30, 25, 22$ and 20 .
 If their median is 39, find x .

d) A book contains 85 pages. A page is chosen at random. What is the probability that the sum of the digits on the page is 8? L2

ALL THE BEST