

SECTION A

All the questions are compulsory:

5 x 10 = 50

Q1) a) Ahmed has a Recurring Deposit Account in a bank. He deposits ₹ 2,500 per month for 2 years. If he gets ₹ 66,250 at the time of maturity, find

i) the interest paid by the bank.

ii) the rate of interest.

4

b) Mr. Prahlad invested ₹ 52000 on ₹ 100 shares at a discount of ₹ 20 paying 8% dividend. At the end of one year, he sells the shares at a premium of ₹ 20. Find

i) the annual dividend

ii) the profit earned including his dividend.

3

c) If P is the solution set of $-3x+4 < 2x-3, x \in \mathbb{N}$ and Q is the solution set of $4x-5 < 12, x \in \mathbb{W}$,

find $Q - P$.

3

Q2)

a) solve the quadratic equation and give your answer correct to two decimal places.

$$5x(x+2) = 3$$

3

b) A shopkeeper buys a number of books of ₹ 80. If he had bought 4 more books for the same amount, each book would have cost ₹ 1 less. Taking the original number of books as x, form an equation in x and solve it.

3

c) The work done by $(x-3)$ men in $(2x+1)$ days and the work done by $(2x+1)$ men in $(x+4)$ days are in the ratio of 3:10. Find the value of x.

4

Q3) a) If $(a-2b-3c+4d)(a+2b+3c+4d) =$

$(a+2b-3c-4d)(a-2b+3c-4d)$, show that $2ad = 3bc$. L3

b) Using the Remainder Theorem, factorize completely the following polynomial: L3

$$3x^3 + 2x^2 - 19x + 6.$$

c) If $A = \begin{bmatrix} 4 & -2 \\ 6 & -3 \end{bmatrix}$ $B = \begin{bmatrix} 0 & 2 \\ 1 & -1 \end{bmatrix}$

$C = \begin{bmatrix} -2 & 3 \\ 1 & -3 \end{bmatrix}$ find $A^2 - A + BC$

Q4)

a) The sum of first seven terms of an A.P is 182. If its 4th and 17th terms are in the ratio 1:5, find the A.P. L3

b) ABC is a triangle. PQ is a line segment intersecting AB in P and AC in Q such that $PQ \parallel BC$ and divides ΔABC in two parts equal in area. Find BP/AB . L3

c) Draw a line $AB = 5\text{cm}$. Mark a point C on AB such that $AC = 3\text{cm}$. Using a ruler and a compass only, construct:

i) a circle of radius 2.5cm, passing through A and C

ii) Construct two tangents to the circle from the external point B. Measure and record the length of the tangents. L4

Q57 a) The height of a solid cone is 30cm. A small cone is cut off from the top of it such that the base of the cone cut off and the base of the given cone are parallel to each other. If the vol. of the cone cut and volume of the original cone are in the ratio 1:27; find the height of the remaining part of the given cone. L4

b) Prove : L3

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

c) Find the lower quartile, upper quartile and inter quartile range for the data : 9, 11, 15, 19, 17, 13, 7. L3

SECTION B

Answer any three questions. 3X10 = 30.

Q64 a) In a right triangle ABC, a circle with AB as diameter is drawn to intersect the hypotenuse AC in P. Prove that the tangent at P, bisects the side BC. L3

b) One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting :

i) a black face card.

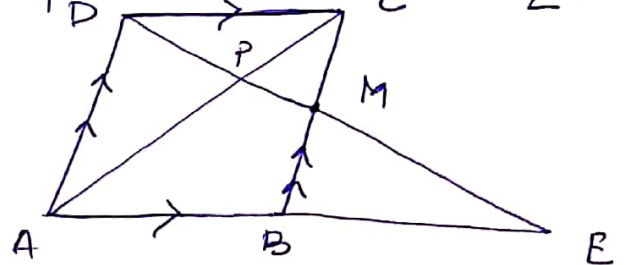
ii) a diamond

iii) the jack or the queen of hearts L3

c) From an aeroplane vertically above a straight horizontal plane, the angle of depression of two consecutive kilometer stones on the opposite sides of the aeroplane are found to be α and β . Show that the height of the aeroplane is $\frac{\tan \alpha \tan \beta}{\tan \alpha + \tan \beta}$. L4

Q74 a) Find the equation of the line whose x-intercept is 8 and y-intercept is -12. L3

b) In the following figure, M is mid-point of BC of a parallelogram ABCD. DM intersects the diagonal AC at P and AB produced at E. L3
 Prove that $PE = 2PD$.



c) Water flows through a cylindrical pipe of internal diameter 7 cm at 5 m/s. Calculate:

- i) the volume, in litres, of water discharged by the pipe in one minute,
- ii) the time, in minutes, the pipe would take to fill an empty rectangular tank $4\text{ m} \times 3\text{ m} \times 2.31\text{ m}$. L4

Q87

a) Given $x = \frac{\sqrt{a^2+b^2} + \sqrt{a^2-b^2}}{\sqrt{a^2+b^2} - \sqrt{a^2-b^2}}$ L3

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

b) In an A.P, the sum of first n terms is $\frac{3n^2}{2} + \frac{5n}{2}$. Find its 25th term. L3

c) A company with 4000 shares of nominal value of ₹ 110 each declares an annual dividend of 15%. Calculate: L4

- i) the total amount of dividend paid by the company.
- ii) the annual income of Ravi who holds 100 shares in the company.
- iii) if he received only 10% on his investment, find the price Ravi paid for each share.

Q97

a) Given $A = \{x : -8 < 5x + 2 \leq 17, x \in \mathbb{Z}\}$
 $B = \{x : -2 \leq 7 + 3x < 17, x \in \mathbb{R}\}$ L3

Represent A and B on two different number lines. Write down the elements of $A \cap B$.

b) A motor boat, whose speed is 9 km/h in still water, goes 12 km downstream and comes back in a total time of 3 hours. Find the speed of the stream. L3

- c) Points A (3, 4) and B (0, 2) are given. Find the image:
- i) A' of A under reflection in the x-axis.
 - ii) B' of B under reflection in the line AA' L4
 - iii) A'' of A " " " Y-axis
 - iv) B'' of B " " " AA''