Q1. $5\tan^2 A - 5\sec^2 A + 1$ is equal to

(a) 6 (b) -5 (c) 1. (d) -4

Q2.The distance of the point P(2, 3) from the x-axis is

(a) 2. (b) 3 (c) 1. (d) 5

Q3. The $(n-1)$th term of an A.P. is given by 7,12,17, 22,… is

(a) $5n + 2$. (b) $5n + 3$. (c) $5n - 5$. (d) $5n - 3$

Q4. The polynomial equation $x(x + 1) + 8 = (x + 2)\{x - 2\}$ is

(a) linear equation. (b) quadratic equation. (c) cubic equation. (d) bi-quadratic equation

Q5. Graphically, the pair of equations $7x - y = 5$; $21x - 3y = 10$ represents two lines which are

(a) intersecting at one point. (b) parallel. (c) intersecting at two points. (d) coincident

Q6. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2, then the value of k is

(a) 10 . (b) -10. (c) 5 (d) -5

Q7. The sum of two different irrational numbers is always

(a) rational. (b) irrational. (c) both of above. (d) none of above

Q8. What is the minimum value of sin A, $0 \le A \le 90°$

(a) -1. (b) 0. (c) 1. (d) 1/2

Q9. The distance of the point (α, β) from the origin is

(a) $\alpha + \beta$. (b) $\alpha^2 + \beta^2$. (c) $|\alpha| + |\beta|$. (d) $\sqrt{\alpha^2 + \beta^2}$

Q10. In ABC, DE || AB. If CD = 3 cm, EC = 4 cm, BE = 6 cm, then DA is equal to

(a) 7.5 cm. (b) 3 cm. (c) 4.5 cm. (d) 6 cm

Q11. The nth term of an A.P. is given by an = 3 + 4n. The common difference is

(a) 7 (b) 3. (c) 4 (d) 1

Q12. ABC is an equilateral triangle of side a. Its area will be…

(a) $\sqrt{3}/4a^2$. (b) $\sqrt{3}a/2$. (c) $\sqrt{3}a/4$. (d) $\sqrt{3}a^2/2$

Q13. The sum of the roots of the quadratic equation $3x^2 - 9x + 5 = 0$ is

(a) 3. (b) 6. (c) -3. (d) 2

Q14 The shadow of a tower is equal to its height at 10-45 a.m. The sun's altitude is
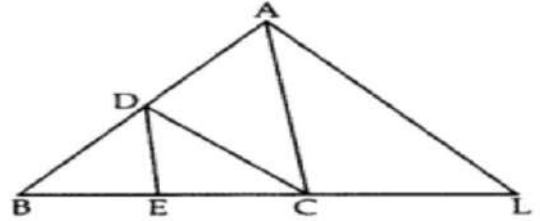
(a) 30°. (b) 45° (c) 60° (d)90°

2 marks question

Q15.Find the value of p so that the quadratic equation px(x − 3) + 9 = 0 has two equal roots.

Q16. What is the common difference of an A.P. in which $a_{21} − a_7 = 84$?

Q17. Find a relation between x and y such that the point P(x, y) is equidistant from the points A (2, 5) and B (-3, 7).

3 marks question

Q18. In the given figure, CD || LA and DE || AC. Find the length of CL if BE = 4 cm and EC = 2 cm.

Q19. If tan (A + B) = 3–√ and tan (A − B) = 1/√ 3 where 0 < A + B < 90°, A > B, find A and B.

Q20. From the top of a 60 m high building, the angles of depression of the top and the bottom of a tower are 45° and 60° respectively. Find the height of the tower. (Take 3–√ = 1.73]

Q21. Prove that √3 is irrational.

5 marks question

Q22. A two digit number is seven times the sum of its digits. The number formed by reversing the digits is 18 less than the given number. Find the given number.

Q23. Prove that:
$$\frac{\cos^2 \theta}{1 - \tan \theta} + \frac{\sin^3 \theta}{\sin \theta - \cos \theta} = 1 + \sin \theta \cos \theta.$$

Q24. From the top of a tower 100 m high, a man observes two cars on the opposite sides of the tower with angles of depression 30° and 45° respectively. Find the distance between the cars. (Use –√ 3 = 1.732] .

Q25. ABC is a triangle right angled at C. If p is length of the perpendicular from C to AB and AB = c, BC = a and CA = b, then prove that:

(i) pc = ab   (ii) $1/p^2 = 1/a^2 + 1/b^2$

Q26. Case Study
COVID-19 Pandemic The COVID-19 pandemic, also known as coronavirus pandemic, is an ongoing pandemic of coronavirus disease caused by the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) among humans. The following tables shows the age distribution of case admitted during a day in two different hospitals

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
No. of cases	6	11	21	23	14	5

1. . Find average age for which maximum cases occurred
2. Find the upper limit of modal class