

SECTION – A (10 Q of 1 marks each)

1. If sum of the squares of zeros of the quadratic polynomial $f(x) = x^2 - 8x + k$ is 40, find the value of k .
2. If the system of equations $3x + y = 1$ and $(2k - 1)x + (k - 1)y = 2K + 1$ is inconsistent, then find the value of k .
3. Find the sum of n terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + \dots$
4. Find the value of $\sqrt{6} + \sqrt{6 + \sqrt{6}} + \dots$
5. If angles, A, B, C , of a ΔABC form an increasing AP, then find the value of $\sin B$
6. If ABC and DEF are similar triangles such that angle $A = 47^\circ$ and angle $E = 83^\circ$, then find angle C .
7. If four sides of a quadrilateral $ABCD$ are tangential to a circle, then prove:
 $AB + CD = BC + AD$
8. The probability of guessing the correct answer to a certain test questions is $x/12$, if the probability of not guessing the correct answer to this question is $2/3$ then find x .
9. If a cone is cut into two parts by a horizontal plane passing through the mid point of its axis, then find the ratio of the volumes of the upper part and the cone.
10. By which kind of graphs (Graphically) how we can obtain mean, mode, median.

SECTION – B (5 Q of 2 marks each)

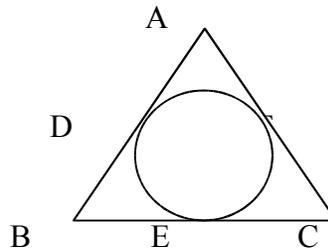
11. Solve

$$\frac{2x}{a} + \frac{y}{b} = 1 \text{ and } \frac{3x}{a} - \frac{3y}{b} = 12$$

12. If $\sqrt{3} \tan \theta = 3 \sin \theta$, find the value of $\sin^2 \theta - \cos^2 \theta$

13. Find the distance between the points $(a \cos 35^\circ, 0)$ and $(0, a \cos 55^\circ)$

14. If $AB = AC$, prove that $BE = EC$.



15. Savita and Hamida are friends. What is the probability that both will have
(i) the same birthday? (ii) Different birthdays? (Ignoring a leap year)

SECTION – C (10 Q of 3 marks each)

16. Find the greatest number which divides 2011 and 2623 leaving remainders 9 and 5 respectively.

OR

Prove that one of every three consecutive positive integers is divisible by 3.

17. A boat covers 32km upstream and 36 km downstream in 7 hours. Also, it covers 40 km upstream and 48 km downstream in 9 hours. Find the speed of the boat in still water and that of the stream.

OR

8 men and 12 boys can finish a piece of work in 10 days while 6 men and 8 boys can finish it in 14 days. Find the time taken by one man alone and that by one boy alone to finish the work.

18. Find four number in A.P. whose sum is 20 and the sum of whose squares is 120.

OR

Raghav buys a shop for Rs.1,20,000. He pays half of the amount in cash and agrees to pay the balance in 12 annual installments of Rs.5000 each. If the rate of interest is 12% and he pays with each installment the interest due on the unpaid amount, find the total cost of the shop.

19. Solve

$$\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}, a+b \neq 0$$

20. If $A + B = 90^\circ$, prove that

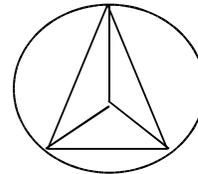
$$\sqrt{\frac{\tan A \tan B + \tan A \cot B}{\sin A \sec B} - \frac{\sin^2 B}{\cos^2 A}} = \tan A$$

OR

(i) $(1 + \cot \theta - \operatorname{cosec} \theta)(1 + \tan \theta + \sec \theta) = 2$

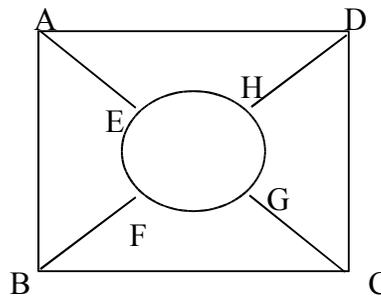
(ii) $\frac{\sin \theta - 2 \sin 3\theta}{2 \cos 3\theta - \cos \theta} = \tan \theta$

21. Find the coordinates of the circumcentre of the triangle whose vertices are (8,6), (8,-2) and (2,-2). Also find its circum radius.



22. Determine the ratio in which the line $3x + y - 9 = 0$ divides the segment joining the points (1,3) and (2,7)

23. The square ABCD is divided into five equal parts, all having same area. The central part is circular and lines AE, GC, BF and HD lie along the diagonals AC and BD of the square. If $AB = 22\text{cm}$, find (i) the circumference of the central part. (ii) the perimeter of the part ABEF.



24. Draw a triangle ABC with side $BC = 7\text{ cm}$, angle $B = 45^\circ$, angle $A = 105^\circ$, then construct a triangle whose sides are $\frac{4}{3}$ times the corresponding side of ABC.

25. If two sides and a median bisecting the third side of a triangle are respectively proportional to the corresponding sides and the median of another triangle, then the two triangles are similar.

OR

Prove that the line segments joining the mid points of the sides of a triangle form four triangles, each of which is similar to the original triangle.

SECTION – D (5 Q of 6 marks each)

26. (i) If the price of a book is reduced by Rs5, a person can buy 5 more books for Rs300. find the original list price of the book

(ii) Students of a class are made to stand in rows, if one student is extra in a row, there would be 2 rows less. If one student is less in a row there would be 3 rows more, find the number of students in the class.

27. A man standing on the deck of a ship, which is 10m above water level. He observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of the hill as 30° . calculate the distance of the hill from the ship and height of the hill .

28. Show that in a right-angled triangle, the square of the hypotenuse is equal to the sum of the squares of the other two Sides.

triangle ABC is an obtuse triangle, obtuse angles at B if AD perpendicular to CB show that $AC^2 = AB^2 + BC^2 + 2 BC \times BD$.

29. The internal and external radii of a hollow hemisphere are 7m and 14m then find the cost of painting its all sides and also find the capacity of this hemisphere in liters.
30. The following table shows the age distribution of cases of a certain disease admitted during a year in a particular hospital. Find the average age for which maximum cases occurred. (mode)

Age (in years):	5-14	15-24	25-34	35-44	45-54	55-64
No. of cases:	6	11	21	23	14	5

OR

A frequency distribution of the life times of 400 T.V. picture tubes tested in a tube company is given below. Find the average life of tube.

Expenditures (in Rs.)	Frequency	Expenditures (in Rs.)	Frequency
300-399	14	800-899	62
400-499	46	900-999	48
500-599	58	1000-1099	22
600-699	76	1100-1199	6
700-799	68		