

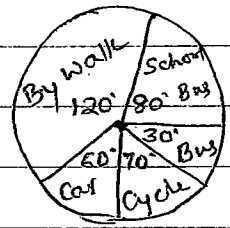
Time: 3 hours

Marks: 80

Multiple choice questions.

- If $T_n = 2n - 1$ then $S_9 =$
(A) 5 (B) 7 (C) 9 (D) 15
- If ${}^n C_6 = {}^n C_n$ then the value of n .
(A) 17 (B) 11 (C) 6 (D) 5
- If Ramesh has the probability of winning the Kabaddi game 0.4, then the probability of losing it is
(A) 0 (B) 0.4 (C) 0.6 (D) 1

- The different modes of 36 students of a class those who are coming to the schools is as shown in the given pie chart. The number of students come by bus is



- (A) 3 (B) 10 (C) 30 (D) 36
- If $f(x) = x^2 + 6x - 8$ Then $f(-2) =$
(A) 8 (B) 16 (C) -16 (D) 24

6. $\cos \theta \times \operatorname{cosec} \theta =$

- (A) $\sin \theta$ (B) $\cot \theta$ (C) $\tan \theta$ (D) $\sec \theta$.

- If the standard form of the equation is $y = mx + c$ then slope is

- (A) $m = \frac{y-c}{x}$ (B) $m = \frac{y+c}{x}$ (C) $m = \frac{x}{y+c}$ (D) $m = \frac{x}{y-c}$

- If two lines are mutually perpendicular then

- (A) their slopes are equal
(B) the product of the slopes is -1.
(C) the product of slopes is 1
(D) slopes are 0.

One mark questions.

- Write the notational form of Euclid's division algorithm.

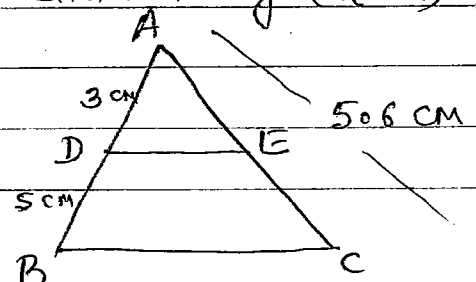
- If A and B are disjoint sets, then $n(A \cup B) =$

11. If $f(x) = x^2 + 6x - 8$ then $f'(x) =$

- What is the remainder if $p(x)$ is divided by $(x-a)$?

- In the figure, $DE \parallel BC$, then

find the value of AE.



13. What is the type of angle formed in the major segments?

14. Curved surface area of a cylinder is 88 sq. cm. and its height is 14 cm. What is the radius of its base?
Two marks questions.

15. Prove that $5 - \sqrt{3}$ is irrational number.

16. In a village 93 persons speak Kannada, 63 persons speak Hindi and 45 persons speak English. and 45 speak Kannada and Hindi, 24 speak Hindi and English, 27 speak English and Kannada language. Then find the number who speak Kannada, Hindi and English and represent in a Venn diagram.

17. (i) Write the fundamental principle of counting.

(ii) What is the meaning of 5P_3 ?

18. In a function, every person shakes hand with every other person. The total number of shake hands is 45. Find the number of persons in the function.

19. There are 5 red and 6 yellow roses in a basket. A child picks up 3 roses randomly. Find the probability of picking up 2 red roses or one yellow rose.

20. Simplify: $\frac{1}{8}\sqrt{50} + \frac{1}{6}\sqrt{75} - \frac{1}{8}\sqrt{18} - \frac{1}{3}\sqrt{3}$.

21. Rationalize the denominator and simplify.

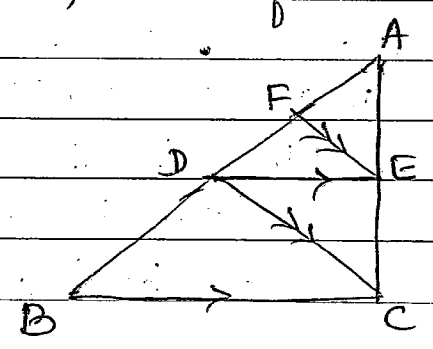
$$\frac{\sqrt{3} + \sqrt{2}}{\sqrt{3} - \sqrt{2}}$$

22. Find the remainder if $p(x) = x^3 + 3x^2 - 5x + 8$ is divided by $g(x) = x - 3$ using remainder theorem.
OR

Find the remainder if $3x^3 + 11x^2 + 34x + 106$ is divided by $x - 3$ using synthetic division method.

23. If the area of circle is $49\pi \text{ cm}^2$, then find its perimeter.

24. In ΔABC , $BC \parallel DE$ and $CD \parallel EF$.
Prove that $AD^2 = AF \times AB$.



25. Prove that $(1 + \tan^2 \theta) \cos^2 \theta = 1$

26. Find the distance between the points $(8, 3)$ and $(8, -7)$.

27. Draw a circle of radius 3 cm and construct a pair of tangents such that the angle between them is 40° .

28. Diameter of two cones are equal and ratio of their slant heights are in the ratio $5:4$. Find the ratio of the curved surface area of the cones.

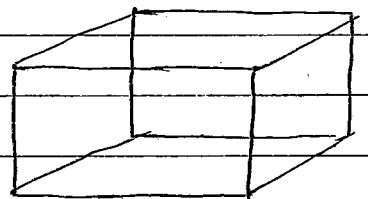
OR

A solid metallic sphere having base 4.2 cm is melted and constructed into circular cone having height 8.4 cm. Find the radius of the cone.

29. Draw a plan for the records from the surveyor's field book, given below. (Scale $20\text{ m} = 1\text{ cm}$)

	To D (in metres)	
	150	
	100	To C 70
To E 80	80	
	30	To B 40
	From A	

30. Verify Euler's formula for the following polyhedron.



Three marks questions

31. The ratio of 7th to 3rd term of an AP is $12:5$. Find the ratio of 13th to 4th term.

32. In a study of heart patients in a hospital, the following observations were noted. Find the standard deviation of the distribution.

Age (in years)	10-20	20-30	30-40	40-50	50-60
No. of patients.	2	5	6	5	2

33. If one root of an equation $x^2 + px + q = 0$ is 3 times the other, then prove that $3p^2 = 16q$.

OR.

If m and n are the roots of equation $x^2 - 3x + 4 = 0$ form the equation whose roots are m^2 and n^2 .

34. Prove that in a trapezium the line joining the mid-points of non-parallel sides is parallel to the parallel sides.

35.

OR

If the diagonals of a quadrilateral divide each other proportionally, then prove that the quadrilateral is a trapezium.

35. From the top of a ~~ground~~ building of height $50\sqrt{3}$ m the angle of depression of a car on the ground is observed to be 60° . Find the distance of the car from the building.

OR

Prove that $\frac{\sin \theta}{1 + \cos \theta} + \frac{1 + \cos \theta}{\sin \theta} = 2 \operatorname{cosec} \theta$

36. Prove that if two circles touch each other, the centres and the point of contact are collinear.

OR

P. That tangents drawn from an external point to a circle (a) are equal

(b) subtend equal angles at the centre

(c) are equally inclined to the line joining the centres and external point.

~~37.~~ Four marks questions.

37. Sum of first 10 terms of an A.P. is 210. Difference between 8th and 2nd terms is 24. Write the sequence

OR

A man plucks 8 coconuts from first tree. In consequent trees he plucks 2 times of previous one. What is the total number of coconuts plucked from next 10 trees? Also find the total number of coconuts in the 12th tree.

38 Draw the graph of $y = x^2 + x - 6$ and find the roots.

39. State and prove pythagoras theorem.

40. Construct a direct common tangent to the two circles of radii 4 cm and 8 cm whose centres are 8 cm apart. Measure and verify the length of tangent.