V9M

Virudhunagar District

Common Half Yearly Examination - December 2025

Standard 9

MATHEMATICS

Time: 3.00 Hrs. Marks: 100

PART - I

I. Choose the best answer: **14×1=14**

1) If $B \subseteq A$ then $n(A \cap B)$ is _____.
   a) $n(A-B)$ b) $n(B)$ c) $n(B-A)$ d) $n(A)$
2) If $n(A \cup B \cup C) = 100$, $n(A) = 4x$, $n(B) = 6x$, $n(C) = 5x$, $n(A \cap B) = 20$, $n(B \cap C) = 15$, $n(A \cap C) = 25$ and $n(A \cap B \cap C) = 10$ then the value of x is
   a) 10 b) 15 c) 25 d) 30
3) S = The set of all leap years between 1882 and 1906 then cardinal number of set S = _____.
   a) 5 b) 6 c) 12 d) 25
4) Which one of the following has a terminating decimal expansion?
   a) $\frac{5}{64}$ b) $\frac{8}{9}$ c) $\frac{14}{15}$ d) $\frac{1}{12}$
5) $4\sqrt{7} \times 2\sqrt{3}$ = _____.
   a) $6\sqrt{10}$ b) $8\sqrt{21}$ c) $8\sqrt{10}$ d) $6\sqrt{21}$
6) $\left(\sqrt[n]{a}\right)^n$ =
   a) n b) $\sqrt{n}$ c) a d) $\sqrt{a}$
7) Degree of the polynomial $(y^3-2)(y^3+1)$ is _____.
   a) 9 b) 2 c) 3 d) 6
8) Which of the following is a solution of the equation $2x-y = 6$ _____.
   a) (2, 4) b) (4, 2) c) (3, −1) d) (0, 6)
9) Polygon having any one of the interior angle greater then 180° is _____.
   a) Regular polygon b) Concave polygon
   c) Convex polygon d) None of the above
10) In a cyclic quadrilaterals ABCD, $\angle A = 4x$, $\angle C = 2x$ then value of x is _____.
   a) 30° b) 20° c) 15° d) 25°
11) If $(x+2, 4) = (5, y-2)$, then the coordinate (x, y) are _____.
   a) (7, 2) b) (6, 3) c) (3, 6) d) (2, 1)
12) The ratio in which the x-axis divides the line segment joining the points (6, 4) and (1, −7) is _____.
   a) 2:3 b) 3:4 c) 4:7 d) 4:3
13) If sin 30° = x and cos 60° = y then x^2+y^2 is _____.
   a) 1/2 b) 0 c) sin 90° d) cos 90°
14) The value of tan1° tan2° tan3° ..... tan89° is _____.
   a) 0 b) 1 c) 2 d) $\frac{\sqrt{3}}{2}$

PART - II

II. Answer any 10 questions: [Q.No. 28 is compulsory] **10×2=20**

15) If R = {l, m, n, o, p} and S = {j, l, n, q} find R∆S.
16) If A = {1, 3, 5}, B = {2, 3, 5, 6} then verify $n(A \cup B) = n(A)+n(B)-n(A \cap B)$.
17) Find any four rational numbers between $\frac{-7}{11}$ and $\frac{2}{11}$.
18) Write in scientific notation: $(300000)^2 \times (20000)^4$
19) The length of a rectangle is (3x+2) units and its breadth is (3x−2) unit. Find its are in term of x. What will be the area if x=20 units?
20) Evaluate by using identities: 1001^3
21) Find the value of K for which the system of linear equation $8x+5y = 9$, $Kx+10y = 15$ has no solutions.

22) In a quadrilateral ABCD, $\angle A = 72^\circ$ and $\angle C$ is the supplementary of $\angle A$. The other two angles are $2x-10$ and $x+4$. Find the value of x and the measure of all the angles.

23) A chord is 12 cm away from the centre of the circle of radius 15 cm. Find the length of the chord.

24) If (x, 3), (6, y), (8, 2) and (9, 4) are the vertices of a parallelogram taken order, then find the value of x and y.

25) Find the centroid of the triangle whose vertices are (2, −4), (−3, −7) and (7, 2).

26) Find the value of $8\sin 2x \cos 4x \sin 6x$, when $x = 15^\circ$.

27) Find the angle made by ladder of length 10m with the ground, if one of its end is 5m away from the wall and the other end is on the wall.

28) Simplify: $\sqrt{112} - \sqrt{252} + \sqrt{28}$

PART - III

III. Answer any 10 questions: [Q.No. 42 is compulsory] **10×5=50**

29) Verify $A-(B\cap C) = (A-B) \cup (A-C)$ using Venn diagrams.

30) In a college, 240 students play cricket, 180 students play football, 164 students play hockey, 42 play both cricket and football, 38 play football and hockey, 40 play both cricket and hockey and 16 play all the three games. If each student participate in atleast one game, then find (i) the number of students in the college (ii) the number of students who play only one game.

31) Find the value of a and b if $\frac{\sqrt{5}-2}{\sqrt{5}+2} = a + b\sqrt{5}$.

32) Arrange surds in descending order: $\sqrt[2]{\sqrt[3]{5}}$, $\sqrt[3]{\sqrt[4]{7}}$, $\sqrt{\sqrt{3}}$

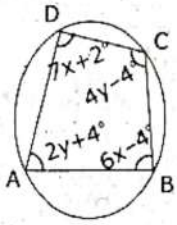
33) Is $(3x-2)$ a factor of $3x^3+x^2-20x+12$?

34) Factorise: $x^3+x^2-14x-24$

35) Solve by Cross Multiplication method:
$6x+7y = 11$; $5x+2y = 13$

36) Prove that in a parallelogram, opposite sides are equal.

37) Find all the angles of the given cyclic quadrilateral ABCD in figure.



38) Show that the point A(7, 10), B(−2, 5), C(3, −4) are the vertices of a right angled triangle.

39) The vertices of a triangle are (1, 2), (h, −3) and (−4, k). If the centroid of the triangle is at the point (5, −1) then find the value of $\sqrt{(h+k)^2 + (h+3k)^2}$.

40) If $\sec\theta = \frac{13}{5}$, then show that $\frac{2\sin\theta - 3\cos\theta}{4\sin\theta - 9\cos\theta} = 3$.

41) Find the value of $\tan 7^\circ \tan 23^\circ \tan 60^\circ \tan 67^\circ \tan 83^\circ$.

42) If $A = \{0, 2, 4, 6, 8\}$, $B = \{x : x \text{ is a prime number and } x<11\}$ and $C = \{x : x \in N \text{ and } 5 \le x < 9\}$ then verify $A\cup(B\cap C) = (A\cup B)\cap(A\cup C)$.

PART - IV

IV. Answer all the questions: **2×8=16**

43) Construct the centroid of ΔPQR whose sides are PQ = 8 cm, QR = 6 cm, PR = 7 cm.

(OR)

Construct ΔABC in which AB = BC = 6 cm and $\angle B = 80^\circ$. Locate its incentre and draw the incircle.

44) Draw the graph: $y = \left(\frac{2}{3}\right)x + 3$

(OR)

Solve graphically: $x+y = 7$; $x-y = 3$
