TVL9M

Tirunelveli District
Half Yearly Examination - December 2025

Standard 9
MATHS
Part - I

Time: 3.00 Hrs. Marks: 100

Answer all the questions: **14×1=14**

1) The set p = $\frac{x}{x \in z}, -1 < x < 1$ is a
   a) singleton set b) power set c) null set d) sub set
2) Which of the following is true?
   a) A−B = A∩B b) A−B = B−A c) (A∪B)' = A'∪B' d) (A∩B)' = A'∪B'
3) If J = set of three sides shapes K = set of shapes with two equal sides and L = set of shapes with right angle, then J ∩ K ∩ L is
   a) set of Isoceles triangles b) set of equilateral triangles
   c) set of isoceles right triangles d) 1 set of right angled triangles
4) Find the odd one out of the following
   a) $\sqrt{32} \times \sqrt{2}$ b) $\frac{\sqrt{27}}{\sqrt{3}}$ c) $\sqrt{72} \times \sqrt{8}$ d) $\frac{\sqrt{54}}{\sqrt{18}}$
5) When written with a rational denominator, the expression $\frac{2\sqrt{3}}{3\sqrt{2}}$ can be simplified as
   a) $\frac{\sqrt{2}}{3}$ b) $\frac{\sqrt{3}}{2}$ c) $\frac{\sqrt{6}}{3}$ d) $\frac{2}{3}$
6) The zero of the polynomial 2x+5 is
   a) $\frac{5}{2}$ b) $\frac{-5}{2}$ c) $\frac{2}{5}$ d) $\frac{-2}{5}$
7) Degree of the constant polynomial is
   a) 3 b) 2 c) 1 d) 0
8) The G.C.D. of x^4-y^4 and x^2-y^2 is
   a) x^4-y^4 b) x^2-y^2 c) $(x+y)^2$ d) $(x+y)^4$
9) The exterior angle of a triangle is equal to the sum of two
   a) Exterior angles b) Interior opposite angles
   c) Alternate angles d) interior angles
10) The angles of the triangle are 3x−40, x+20, 2x−10, then the value of x is
   a) 40° b) 35° c) 50° d) 45°
11) If (x+2, 4) = (5, y−2) then the co-ordinates (x, y) are
   a) (7, 12) b) (6, 3) c) (3, 6) d) (2, 1)
12) If (1, −2) (3, 6) (x, 10) and (3, 2) are the vertices of the parallelogram taken in order then the value of x is
   a) 6 b) 5 c) 4 d) 3
13) If sin 30° = x and cos 60° = y, then x^2+y^2 is
   a) ½ b) 0 c) sin 90° d) cos 90°
14) The value of $\frac{1-\tan^2 45^\circ}{1+\tan^2 45^\circ}$ is
   a) 2 b) 1 c) 0 d) $\frac{1}{2}$

Part - II

Answer any 10 questions only. Question no. 28 is compulsory: **10×2=20**

15) Define: (i) Set with an example. (ii) Equal sets with an example.
16) Find the symmetric difference between the following sets:
   R = {ℓ, m, n, o, p} and S = {j, ℓ, n, q}
17) If n(A) = 36, n(B) = 10, n(A∪B) = 40 and n(A') = 27 find n( ) and n(A∩B)
18) Represent $\frac{-4}{11}$ as decimal form.

19) Simplify: $\sqrt{63} - \sqrt{175} + \sqrt{28}$

20) Write the coefficient of x^2 and x in this polynomial $\sqrt{3}x^2 + \sqrt{2}x + 0.5$

21) Factorise: $27x^3+125y^3$

22) Find the G.C.D. of a^{m+1}, a^{m+2}, a^{m+3}

23) The length of the diagonals of a Rhombus are 12 cm and 16 cm. Find the side of the Rhombus.

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

25) Find the midpoints of the line segment joining the points (8, −2) and (−8, 0)

26) If the centroid of a triangle is at (4, −2) and two of its vertices are (3, −2) and (5, 2) then find the third vertex of the triangle.

27) Evaluate: $\dfrac{\tan 45^\circ}{\tan 30^\circ + \tan 60^\circ}$

28) If tan B = cot 47°, then find B.

Part - III

Answer any 10 questions only. Questions no. 42 is compulsory: **10×5=50**

29) i) If n(A) = 4, find n[P(A)]
ii) If n[P(A)] = 256, find n(A)

30) Verify $(A \cup B)' = A' \cap B'$ using Venn diagram.

31) In an examination 50% of the students passed in Maths and 70% of students passed in science while 10% students failed in both subjects. 300 students passed in both the subjects. Find the total number of students who appeared in the examination, if they took examination in only two subjects.

32) Arrange surds in descending order: $\sqrt[3]{5}, \sqrt[9]{4}, \sqrt[6]{3}$

33) Given $\sqrt{2} = 1.414$, find the value of $\dfrac{8-5\sqrt{2}}{3-2\sqrt{2}}$ (to 3 place of decimals)

34) If $x^2 + \dfrac{1}{x^2} = 23$, then find the value of $x + \dfrac{1}{x}$ and $x^3 + \dfrac{1}{x^3}$

35) Factorise: (i) $x^2+10x+24$ (ii) $x^2+2mn-24n^2$

36) Given 4a + 3b = 65 and a+2b = 35 solve by elimination method.

37) Show that the bisectors of angles of a parallelogram form a rectangle.

38) Find the length of a chord which is at a distance of $2\sqrt{11}$ cm from the centre of a circle of radius 12 cm.

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

40) Find the co-ordinates of the points of trisection of the line segment joining the points A(−5, 6), B(4, −3)

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

42) Find the area of the right angled triangle with hypotenuse 5 cm and one of the acute angle is 48°30'.

Part - IV

Answer the following: **2×8=16**

43) a] Draw and locate the orthocentre of a right triangle PQR where PQ = 4.5 cm, QR = 6 cm and PR = 7.5 cm. **(OR)**
b] Construct the incentre of ABC with AB = 6 cm ∠B = 65° and AC = 7 cm. Also draw the incircle and measure its radius.

44) a] Draw the graph of y = 3x−1 **(OR)**
b] Solve graphically: x+y = 7; x−y = 3

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