

Ts9M

Tenkasi District Common Examinations
Common Half Yearly Examination - December 2022

**Standard 9****MATHEMATICS**

Time: 3.00 Hrs.

Marks: 100

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

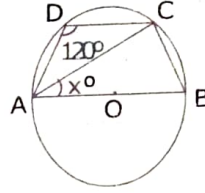
- 1) If $A \cup B = A \cap B$, then
 - a) $A \neq B$
 - b) $A = B$
 - c) $A \subset B$
 - d) $B \subset A$
- 2) If $U = \{x : x \in N \text{ and } x < 10\}$, $A = \{1, 2, 3, 5, 8\}$ and $B = \{2, 5, 6, 7, 9\}$ then $n[(A \cup B)']$ is
 - a) 1
 - b) 2
 - c) 4
 - d) 8
- 3) In a city, 40% people like only one fruit, 35% people like only two fruits, 20% people like all the three fruits. How many percentage of people do not like any one of the above three fruits?
 - a) 5
 - b) 8
 - c) 10
 - d) 15
- 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) When $(2\sqrt{5} - \sqrt{2})^2$ is simplified, we get?
 - a) $4\sqrt{5} + 2\sqrt{2}$
 - b) $22 - 4\sqrt{10}$
 - c) $8 - 4\sqrt{10}$
 - d) $2\sqrt{10} - 2$
- 6) The root of the polynomial equation $2x + 3 = 0$ is
 - a) $\frac{1}{3}$
 - b) $-\frac{1}{3}$
 - c) $-\frac{3}{2}$
 - d) $-\frac{2}{3}$
- 7) Degree of the polynomial $(y^3 - 2)(y^3 + 1)$ is
 - a) 9
 - b) 2
 - c) 3
 - d) 6
- 8) If $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ where $a_1x + b_1y + c_1 = 0$ and $a_2x + b_2y + c_2 = 0$ then the given pair of linear equation has _____ solutions.
 - a) no solution
 - b) two solutions
 - c) unique
 - d) infinite
- 9) If bisectors of $\angle A$ and $\angle B$ of a quadrilateral ABCD meet at O, then $\angle AOB$ is
 - a) $\angle C + \angle D$
 - b) $\frac{1}{2}(\angle C + \angle D)$
 - c) $\frac{1}{2}\angle C + \frac{1}{2}\angle D$
 - d) $\frac{1}{3}\angle C + \frac{1}{2}\angle D$
- 10) AD is a diameter of a circle and AB is a chord. If AD = 30 cm and AB = 24 cm then the distance of AB from the centre of the circle is
 - a) 10 cm
 - b) 9 cm
 - c) 8 cm
 - d) 6 cm
- 11) The point whose ordinate is 4 and which lies on the y-axis is _____
 - a) (4, 0)
 - b) (0, 4)
 - c) (1, 4)
 - d) (4, 2)
- 12) In what ratio does the y-axis divides the line joining the points (-5, 1) and (2, 3) internally
 - a) 1:3
 - b) 2:5
 - c) 3:1
 - d) 5:2
- 13) If $\sin 30^\circ = x$ and $\cos 60^\circ = y$, then $x^2 + y^2$ is
 - a) $\frac{1}{2}$
 - b) 0
 - c) $\sin 90^\circ$
 - d) $\cos 90^\circ$
- 14) The value of $\frac{1 - \tan^2 45^\circ}{1 + \tan^2 45^\circ}$ is
 - a) 2
 - b) 1
 - c) 0
 - d) $\frac{1}{2}$

II. Answer any 10 questions: (Question No. 28th compulsory)**10 × 2 = 20**

- 15) If $n[P(A)] = 256$, find $n(A)$.
- 16) If $A = \{6, 7, 8, 9\}$ and $B = \{8, 10, 12\}$ find $A \Delta B$.
- 17) If $n(A) = 36$, $n(B) = 10$, $n(A \cup B) = 40$ and $n(A') = 27$ find $n(U)$ and $n(A \cap B)$.
- 18) Give any two rational numbers lying between 0.5151151115..... and 0.5353353335.....
- 19) Simplify: $3\sqrt{75} + 5\sqrt{48} - \sqrt{243}$
- 20) Find the number of zeros of the polynomials represented by their graphs.

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- 21) Factorise: $2x^2+15x-27$
 22) Find the GCD of $35x^5y^3z^4$, $49x^2yz^3$, $14xy^2z^2$.
 23) The chord of length 30 cm is drawn at the distance of 8 cm from the centre of the circle. Find the radius of the circle.



- 24) Find the value of x° in the given figure.

- 25) If $(x, 3)$, $(6, y)$, $(8, 2)$ and $(9, 4)$ are the vertices of a parallelogram taken in order, then find the value of x and y .
 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) If $\cos A = \frac{3}{5}$, then find the value of $\frac{\sin A - \cos A}{2 \tan A}$.

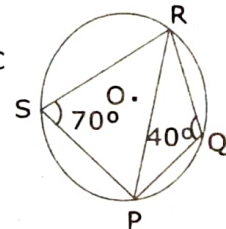
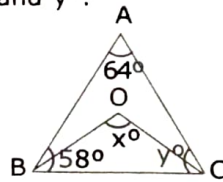
- 28) Find the values of the following:
 $(\cos 0^\circ + \sin 45^\circ + \sin 30^\circ)$ $(\sin 90^\circ - \cos 45^\circ + \cos 60^\circ)$

10 × 5 = 50

III. Answer any 10 questions: (Qn.no. 41 is compulsory)

- 29) If $A = \{x: x \in \mathbb{Z}, -2 < x \leq 4\}$, $B = \{x: x \in \mathbb{W}, x \leq 5\}$, $C = \{-4, -1, 0, 2, 3, 4\}$, then verify $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$.
 30) In a group of 100 students, 85 students speak Tamil, 40 students speak in English, 20 students speak French, 32 speak Tamil and English, 13 speak English and French and 10 speak Tamil and French. If each student knows atleast any one of these languages, then find the number of students who speak all these three languages.
 31) Find any five rational numbers between $\frac{1}{4}$ and $\frac{1}{3}$.
 32) If $x = \sqrt{5} + 2$, then find the value of $x^2 + \frac{1}{x^2}$.
 33) Find the value of m . If $(x-2)$ is a factor of the polynomial $2x^3 - 6x^2 + mx + 4$.
 34) Find the quotient and remainder when $(x^3 + x^2 - 7x - 3)$ is divided by $(x-3)$ using synthetic division.
 35) In the given figure $\angle A = 64^\circ$, $\angle ABC = 58^\circ$. If BO and CO are the bisectors of $\angle ABC$ and $\angle ACB$ respectively of $\triangle ABC$ find x° and y° .

SIVAKUMAR, M,
 Sri Ramon Matric HSS,
 Vallam-627809,
 Tenkasi District.



- 36) If PQRS is a cyclic quadrilateral in which $\angle PSR = 70^\circ$ and $\angle QPR = 40^\circ$, then find $\angle PRQ$.

- 37) Using section formula, show that the points $A(7, -5)$, $B(9, -3)$ and $C(13, 1)$ are collinear.
 38) The vertices of a triangle are $(1, 2)$, $(h, -3)$ and $(-4, k)$. If the centroid of the triangle is at the points $(5, -1)$ then find the value of $\sqrt{(h+k)^2 + (h+3k)^2}$.
 39) Find the values of $\tan 7^\circ \tan 23^\circ \tan 60^\circ \tan 67^\circ \tan 83^\circ$.
 40) Find the area of a right angle triangle whose hypotenuse is 10 cm and one of the acute angle is $24^\circ 24''$.

IV. Answer the questions:

- 41) Solve for x and y , $2x - y = 3$; $3x + y = 7$ by the method of elimination.
 42) Construct the centroid of $\triangle PQR$ whose sides are $PQ = 8$ cm, $QR = 6$ cm, $RP = 7$ cm. (OR) Construct the circumcentre of the $\triangle ABC$ with $AB = 5$ cm, $\angle A = 60^\circ$ and $\angle B = 80^\circ$. Also the circumcircle and find the circumradius of the $\triangle ABC$.
 43) Draw the graph for the equation $y = 2x$.
 Use graphical method to solve the equation $x + y = 7$; $x - y = 3$.

2 × 8 = 16

(OR)