

Register Number :

009315

COMMON ANNUAL EXAMINATION - 2024

STD: 9

MATHEMATICS

Marks : 100

Time : 2.30 hrs

PART - I

Answer all the questions:-

14x1=14

1. If $n(A) = 10$ and $n(B) = 15$, then the minimum and maximum number of elements in $A \cap B$ is
 a) 10,15 b) 15,10 c) 10,0 d) 0,10
2. For any three sets P,Q and R, $P - (Q \cap R)$ is
 a) $P - (Q \cup R)$ b) $(P \cap Q) - R$ c) $(P - Q) \cup (P - R)$ d) $(P - Q) \cap (P - R)$
3. Which of the following is not true?
 a) Every rational number is a real number b) Every integer is a rational number
 c) Every real number is an irrational number d) Always an integer
4. $4\sqrt{7} \times 2\sqrt{3} =$
 a) $6\sqrt{10}$ b) $8\sqrt{21}$ c) $8\sqrt{10}$ d) $6\sqrt{21}$
5. If $x^3 + 6x^2 + kx + 6$ is exactly divisible by $(x+2)$, then $k = ?$
 a) -6 b) -7 c) -8 d) 11
6. Zeros of $(2-3x)$ is _____
 a) 3 b) 2 c) $\frac{2}{3}$ d) $\frac{3}{2}$
7. Degree of constant polynomial is _____
 a) 3 b) 2 c) 1 d) 0
8. A chord is at a distance of 15 cm from the centre of the circle of radius 25cm. The length of the chord is
 a) 25cm b) 20cm c) 40cm d) 18cm
9. The points $(-5,2)$ and $(2,-5)$ lie in the
 a) same quadrant b) II and III quadrant respect
 c) II and IV quadrant respectively d) IV and II quadrant respectively
10. 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)
11. If $\tan \theta = \cot 37^\circ$, then the value of θ is
 a) 37° b) 53° c) 90° d) 1°
12. The perimeter of an equilateral triangle is 30cm. The area is
 a) $10\sqrt{3} \text{cm}^2$ b) $12\sqrt{3} \text{cm}^2$ c) $15\sqrt{3} \text{cm}^2$ d) $25\sqrt{3} \text{cm}^2$
13. The mean of the square of first 11 natural number is
 a) 26 b) 46 c) 48 d) 52
14. The probability of all possible outcomes of a random experiment is always equal to
 a) one b) zero c) infinity d) less than one

PART - II

II. Answer any 10 Questions.

10x2=20

15. Let $A = \{x : x \text{ is an even natural number and } 1 < x \leq 12\}$ and $B = \{x : x \text{ is a multiple of 3, } x \in \mathbb{N} \text{ and } x \leq 12\}$ be two sets. Find $A \cap B$.
16. If $n(A) = 36$, $n(B) = 10$, $n(A \cup B) = 40$ and $n(A') = 27$ Find $n(U)$ and $n(A \cap B)$.
17. Find the value of $81^{\frac{5}{4}}$. (4)
18. Simplify the following. $\sqrt{63} - \sqrt{175} + \sqrt{28}$
19. Find the zeros of the polynomial $f(x) = 2x + 1$
20. Factorise the following. $8x^3 + 125y^3$ (a+b)³

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21. Find the GCD for $35x^5y^3z^4$, $49x^2yz$, $14xy^2z^2$

22. In the figure, AB is parallel to CD. Find x.

23. (3,-9) and (-2,3) find the distance between two points.

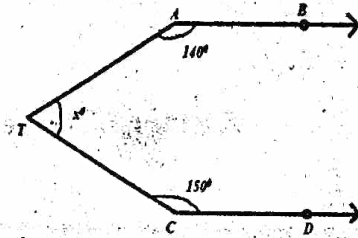
24. Find the coordinates of the points which divides the line segment joining the points A(4,-3) and B(9,7) in the ratio is 3:2.

25. If $\tan A = \frac{2}{3}$, then find all the other trigonometric ratio's.

26. Evaluate $\frac{\sin 49^\circ}{\cos 41^\circ}$

27. Using Heron's formula, find the area of a triangle whose sides are 10cm, 24cm, 26cm.

28. 3.1, 3.2, 3.3, 2.1, 1.3, 3.3, 3.1. Find the mode.



PART - III

III. Answer any 10 questions.

10x5=50

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

30. In a group of 100 students, 85 students speak Tamil, 40 students speak English, 20 students speak French, 32 speak Tamil and English, 13 speak English and French and 10 speak Tamil and French. If each students know atleast any one of these languages, Find the number of students who speak all these languages.

31. Represent $\sqrt{9.3}$ on a number line.

32. Represent $3.\overline{45}$ on the number line upto 4 decimal places.

33. Factorise the equation $x^3 + 8y^3 + 6xy - 1$.

34. Find the quotient and remainder for the following using synthetic division.
 $(x^3 + x^2 - 7x - 3) \div (x - 3)$.

35. Two circles of radii 5 cm and 3 cm intersect at two points and the distance between their centres is 4cm. Find the length of the common chord.

36. Using section formula, show that the points A(7,-5), B(9,-3) and C(13,1) are collinear.

37. Find the points of trisection of the line segment joining (-2,-1) and (4,8).

38. Find the value of $\frac{\tan 45^\circ}{\operatorname{cosec} 30^\circ} + \frac{\sec 60^\circ}{\cot 45^\circ} - \frac{5 \sin 90^\circ}{2 \cos 0^\circ}$

39. A cubical container of side 6.5 m is to be painted on the entire outer surface. Find the area to be painted and the total cost of painting it at the rate of ₹ 24 per m^2 .

40. If the mean of the following data is 20.2, then find the value of p.

41. The probability that it will rain tomorrow is $\frac{91}{100}$. What is the probability that it will not rain tomorrow.

42. Find the quotient and remainder when $(3x^3 - 4x^2 - 5)$ is divided by $(3x + 1)$ using synthetic division.

PART - IV

IV Answer all questions.

2x8=16

43. (A) $y = 4x - 1$, Draw the graph. (or)

(B) Use graphical method to solve the following system of equations.

$$x + y = 5; 2x - y = 4$$

44. (A) Construct the centroid of ΔPQR whose sides are $PQ = 8\text{cm}$, $QR = 6\text{cm}$; $RP = 7\text{cm}$.

(or)

(B) Construct an isosceles triangle PQR where $PQ = PR$ and $\angle Q = 50^\circ$, $QR = 7\text{cm}$.

Also Draw its circumcircle.
