COMMON QUARTERLY EXAMINATION- 2023

A

Standard - IX

**Time : 3.00 hrs**

MATHEMATICS

Marks: 100

14×1=14

I. Answer all the questions:-

1) The set $P=\{x/x \in z, -1<x<1\}$ is a
   a) singleton set   b) power set   c) Null set   d) Subset

2) If $A=\{x, y, z\}$ then the number of non-empty subsets of A is
   a) 8   b) 5   c) 6   d) 7

3) In a class of 50 boys, 35 boys play carrom and 20 boys play chess then the number of boys play both game is
   a) 5   b) 30   c) 15   d) 10

4) For any three sets A, B and C $(A-B) \cap (B-C)$ is equal to
   a) A only   b) B only   c) C only   d) ϕ

5) Which one of the following is an irrational number
   a) $\sqrt{25}$ b) $\sqrt{\frac{9}{4}}$ c) $\frac{7}{11}$ d) π

6) 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) $\frac{\sqrt{54}}{\sqrt{18}}$

7) $\sqrt{27} + \sqrt{12} =$
   a) $\sqrt{39}$ b) $5\sqrt{6}$ c) $5\sqrt{3}$ d) $3\sqrt{5}$

8) 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) $\frac{2}{3}$

9) Degree of the polynomial $(y^3-2)(y^3+1)$ is
   a) 9   b) 2   c) 3   d) 6

10) Zeros of $(2-3x)$ is _____
    a) 3   b) 2   c) $\frac{2}{3}$ d) $\frac{3}{2}$

11) Degree of the constant polynomial is _____
    a) 3   b) 2   c) 1   d) 0

12) If $(2, 3)$ is a solution of linear equation $2x+3y=k$ then, the value of k is
    a) 12   b) 6   c) 0   d) 13

13) If $x-3$ is a factor of $p(x)$, then the remainder is
    a) 3   b) -3 c) $p(3)$ d) $p(-3)$

14) The exterior angle of a triangle is equal to the sum of two
    a) Exterior angle   b) Interior opposite angles
    c) Alternate angles   d) Interior angles

II. Answer any 10 questions. Question No. 28 is compulsory:-   10×2=20

15) If A = (-3, -2, 1, 4) and B={0, 1, 2, 4} find (i) A-B   (ii) B-A

16) If A={b, e, f, g} and B={c, e, g, h} then verify the commutative property of union of sets.

17) If n(A)=36, n(B)=10, n(A∪B)=40 and n(A)=27 find n(U) and n(A∩B).

18) Out of 500 car owners investigated, 400 owned Car A and 200 owned Car B, 50 owned both A and B cars. Is this data correct?

19) Convert the following decimal numbers in the form of $\frac{p}{q} \Rightarrow 0.\overline{3}$

20) Find the value of $(243)^{-?}$

21) Simplify $5\sqrt{3}-18\sqrt{3}-2\sqrt{3}$

22) Find the value of a and b if $\frac{\sqrt{7}-2}{\sqrt{7}+2}=a\sqrt{7}-b$

23) Find the value of the polynomial $f(y)= 6y-3y^2+3$ at y=-1.

24) Find the remainder when $3x^3-4x^2+7x-5$ is divided by (x+3)

25) Factorise $9x^2+12xy+4y^2$

26) The angles of a triangle are in the ratio 1:2:3. Find the measure of each angle of the triangle.

27) In the figure, AB is parallel to CD. Find x.
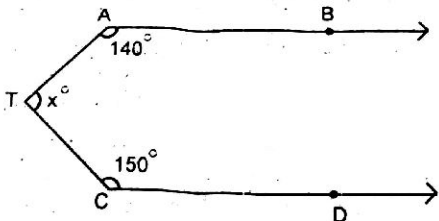
28) Represent the following number in Scientific notation. $(300000)^2 \times (20000)^4$.

**III. Answer any 10 questions. Question No.42 is compulsory:-**   10×5=50

29) If A= {x:x∈z, -2<x≤4}, B={x:x∈w, x≤5}, C={-4, -1, 0, 2, 3, 4} then verify
A∪(B∩C)=(A∪B)∩(A∪C)

30) Verify the De Morgan's law for complementation (A∪B)=Ā∩B̄ using venn diagrams.

31) In a class, all students take part in either music or drama or both. 25 students take part in Music, 30 students take part in drama and 8 students take part in both music and drama. Find
The number of students who take part in only music.
i) The number of students who take part in only drama.
ii) The total number of students in the class.

32) Verify n(A∪B∪C) =n(A)+n(B)+n(C)-n(A∩B)-n(B∩C)-n(A∩C)+n(A∩B∩C) for the following set. A={1,3,5}   B={2,3,5,6}, C={1,5,6,7}

33) Simplify using addition and subtraction properties of surds $3\sqrt{75} + 5\sqrt{48} - \sqrt{243}$

34) Find the decimal expansion of $\sqrt{3}$

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

36) Rationalise the denominator and simplify $\dfrac{\sqrt{48} + \sqrt{32}}{\sqrt{27} - \sqrt{18}}$

37) If $(x+a)(x+b)(x+c) = x^3 + 14x^2 + 59x + 70$ find the value of i) $a+b+c$ ii) $\dfrac{1}{a} + \dfrac{1}{b} + \dfrac{1}{c}$

38) Factorise the following: $4x^2 + 9y^2 + 25z^2 + 12xy + 30yz + 20xz$

39) Find the quotient and remainder when $p(x) = (3x^3 - 2x^2 - 5 + 7x)$ is divided by $d(x) = x+3$ using synthetic division.

40) Factorise the polynomial using synthetic division $x^3 - 3x^2 - 10x + 24$

41) Find all the three angles of the $\triangle ABC$.
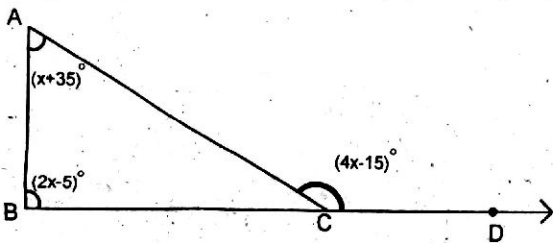
42) If $\left(y - \dfrac{1}{y}\right)^3 = 27$, then find the value of $y^3 - \dfrac{1}{y^3}$

V. Answer the both questions:- 2×8=16

43) a) If $U = \{a, b, c, d, e, f, g, h\}$, $A = \{b, d, f, h\}$ and $B = \{a, d, e, h\}$ find the following sets.
   i) A' ii) B' iii) $A' \cup B'$ iv) $A' \cap B'$ v) $(A \cup B)'$ vi) $(A \cap B)'$
   vii) $(A')'$ viii) $(B')'$

[Or]

b) Represent the following numbers in the scientific notation.
   i) 569430000000   ii) 2000.57
   Write the following numbers in decimal form. i) 3.459×10^6.   ii) 5.678×10^4.

44) a) Construct the centroid of $\triangle PQR$ whose sides are PQ=8cm; QR=6cm; RP=7cm.

[Or]

b) Draw $\triangle ABC$, where AB=6cm, $\angle B = 110°$ and BC=5cm and construct its orthocentre.

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