QUARTERLY COMMON EXAMINATION - 2022

9 - STD   **MATHS**

Time : 2.30 Hrs   Marks : 100

I   **Answer all the questions.**   14 X 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. 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. Let $A = \{\phi\}$ $B = P(A)$ then $A \cap B$ is
   a) $\{\phi, \{\phi\}\}$ b) $\{\phi\}$ c) ϕ d) $\{0\}$

4. Which of the following is true?
   a) $(A - B) = A \cap B$ b) $(A - B) = B - A$ c) $(A \cup B)' = A' \cap B'$ d) $(A \cap B)' = A' \cup B'$

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

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

7. If $\frac{1}{7} = 0.\overline{142857}$ the the value of $\frac{5}{7}$ is
   a) $0.\overline{142857}$ b) $0.\overline{714285}$ c) $0.\overline{571428}$ d) 0.714285

8. $0.\overline{43} + 0.4\overline{3} = $ ....
   a) $0.8\overline{67}$ b) $0.86\overline{7}$ c) $0.\overline{867}$ d) 0.867

9. Zeros of (2-3x) is
   a) 3   b) 2   c) 2/3   d) 3/2

10. The zero of polynomial 2x + 5 is
    a) 5/2   b) -5/2   c) 2/5   d) -2/5

11. If P(a) = 0 then (x - a) is a .... if p(x).
    a) divisor   b) quotient   c) remainder   d) factor

12. If $x^{51} + 51$ is divided by x + 1 then the remainder is
    a) 0   b) 1   c) 49   d) 50

13. 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

14. If the diagonal of a rhombus are equal, then the rhombus is a ....
    a) Parallelogram but not a rectangle   b) Rectangle but not a square
    c) square   d) parallelogram but not a square

II   **Answer 10 questions. Question No. 28 is compulsory.**   10 X 2 = 20

15. If A={6,7,8,9} and B={8,10,12} find A∆B.

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) = 25, n(B) = 40, n(A∪B) = 50 and n(B') = 25 find n(A∩B) and n(∪).

18. Convert the following decimal numbers in the form of p/q $0.4\overline{5}$.

19. Simplify : $5\sqrt{3} + 18\sqrt{3} - 2\sqrt{3}$.

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20. Find the value of a and b if $\dfrac{\sqrt{7}-2}{\sqrt{7}+2} = a\sqrt{7}+b$.

21. Find the value of M, if (x-2) is a factor of the polynomial $2x^3 - 6x^2+mx+4$.

22. Factorise : $2x^2 + 15x + 27$.

23. The length of a rectangle is (3x+2) units and its breadth is (3x-2) units. Find its area interms of x. What will be the area if x = 20 units.

24. Find the quotient and the remainder when $(5x^2 - 7x + 2) \div (x -1)$.

25. The angles of a triangle are in the ratio 1 : 2 : 3 find the measure of each angle of the triangle.

26. In the figure, AB is parallel to CD find x.
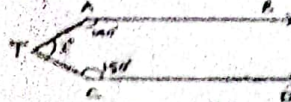
27. $\triangle ABC$ and $\triangle DEF$ are two triangles in which AB = DF, $\angle ACB = 70°$ and $\angle ABC = 60°$, $\angle DEF=70°$ and $\angle EDF = 60°$ prove that the triangles are congruent.

28. Simplify : $(300000)^3 \times (2000)^4$.

III Answer 10 questions. Question No. 42 is compulsory.   **10 X 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 $A\cap(B\cup C) = (A\cap B)\cup(A\cap C)$.

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

31. In an examination 50% of the students passed in Mathematics and 70% of students passed in Science while 10% students failed on 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. Let U = {0,1,2,3,4,5,6,7} A = {1,3,5,7} and B = {0,2,3,5,7} find the following sets.
    i) A'   ii) B'   iii) A'∩ B'   iv) (A∩B)'   v) (B')'

33. Arrange in ascending order $\sqrt[3]{2}, \sqrt[3]{4}, \sqrt[4]{3}$.

34. If $x = \sqrt{5} + 2$ then find the value of $x^2 + \dfrac{1}{x^2}$.

35. Simplify : a) $5\sqrt[3]{40}+2\sqrt[3]{625}-3\sqrt[3]{320}$ b) $\left[\sqrt{\dfrac{225}{729}} - \sqrt{\dfrac{25}{144}}\right] \div \sqrt{\dfrac{16}{81}}$

36. Rationalise the denominator and simplify : $\dfrac{\sqrt[3]{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}}$.

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

38. If the quotient on dividing $x^4 + 10x^3 + 35x^2 + 50x + 29$ by (x+4) is $x^3 - ax^2 + bx + 6$ then find the value of a,b and also remainder.

39. Factorise : $x^3 - 3x^2 - 10x + 24$.

40. The angles of a quadrilateral are in the ratio 2 : 4 : 5 : 7. Find all the angles.

41. The length of the diagonals of a rhombus are 12cm and 16cm find the side of the rhombus.

42. Given $\sqrt{2} = 1.414$ find the value of $\dfrac{8-5\sqrt{2}}{3-2\sqrt{2}}$ (to 3 places of decimals)

IV Answer the both questions.   **2 X 8 = 16**

43. a) Construct the centroid of $\triangle PQR$ whose sides are PQ = 8cm, QR = 6cm, RP = 7cm. *(OR)*
    b) Construct $\triangle PQR$ whose sides are PQ = 6 cm $\angle Q = 60°$ and QR = 7 cm and locate its orthocentre.

44. a) Draw the graph the following : y = 4x - 1. *(OR)*   b) Solve graphically : x + y = 7, x - y = 3.

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