

REGISTER NUMBER :

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**GOVERNMENT HIGHER SECONDARY SCHOOL – THAZHUTHALI**  
**MODEL QUARTERLY EXAMINATION – SEPTEMBER 2022**  
**IX STD – MATHEMATICS**

Time Allowed : 3 hours

Maximum Marks : 100

**PART – I**

Note : (i). Answer all the questions.

14 × 1 = 14

(ii). Choose the most appropriate answer form the given four alternatives and write the option code and the corresponding answer.

- If  $B \subseteq A$ , then  $n(A \cap B)$  is.....  
 (a).  $n(A - B)$  (b).  $n(B)$  (c).  $n(B - A)$  (d).  $n(A)$
- $A \cup B = A \cap B$ , then .....  
 (a).  $A \neq B$  (b).  $A = B$  (c).  $A \subset B$  (d).  $B \subset A$
- If  $n(A \cup B \cup C) = 100$ ,  $n(A) = 4x$ ,  $n(B) = 6x$ ,  $n(C) = 5x$ ,  $n(A \cap B) = 20$ ,  $n(B \cap C) = 15$ ,  $n(A \cap C) = 25$  and  $n(A \cap B \cap C) = 10$ , then the value of  $x$  is .....  
 (a). 10 (b). 15 (c). 25 (d). 30
- 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).  $\emptyset$
- $0.\overline{34} + 0.\overline{34} = \dots\dots\dots$   
 (a).  $0.6\overline{87}$  (b).  $0.\overline{68}$  (c).  $0.6\overline{8}$  (d).  $0.68\overline{7}$
- If  $\sqrt{9x} = \sqrt[3]{9^2}$ , then  $x = \dots\dots\dots$   
 (a).  $\frac{2}{3}$  (b).  $\frac{4}{3}$  (c).  $\frac{1}{3}$  (d).  $\frac{5}{3}$
- Which on the following is an irrational number ?  
 (a).  $\sqrt{25}$  (b).  $\sqrt{\frac{9}{4}}$  (c).  $\frac{7}{11}$  (d).  $\pi$
- If  $\sqrt{80} = k\sqrt{5}$ , then  $k = \dots\dots\dots$   
 (a). 2 (b). 4 (c). 8 (d). 16
- If  $p(a) = 0$ , then  $(x - a)$  is a ..... of  $p(x)$ .  
 (a). divisor (b). quotient (c). remainder (d). factor
- Degree of the constant polynomial is .....  
 (a). 3 (b). 2 (c). 1 (d). 0
- GCD of any two prime numbers is .....  
 (a). -1 (b). 0 (c). 1 (d). 2
- Which of the following is a solution of the equation  $2x - y = 6$   
 (a). ( 2 , 4 ) (b). ( 4 , 2 ) (c). ( 3 , -1 ) (d). ( 0 , 6 )
- 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
- The angles of the triangle are  $3x - 40$ ,  $x + 20$  and  $2x - 10$ , then the value of  $x$  is .....  
 (a).  $40^\circ$  (b).  $35^\circ$  (c).  $50^\circ$  (d).  $45^\circ$

**PART – II**

Note : Answer any 10 questions. Question No.28 is compulsory.

10 × 2 = 20

15. Represent the following set in Roster form.

(i).  $A =$  The set of all even natural numbers less than 20.(ii).  $D = \{ x : x \in Z, -5 < x \leq 2 \}$ .16. Write down the power set of the set  $A = \{ 1, 2, 3 \}$ .17. If  $A = \{ b, e, f, g \}$  and  $B = \{ c, e, g, h \}$ , then verify the commutative property of intersection of sets.18. If  $n(A) = 300$ ,  $n(A \cup B) = 500$ ,  $n(A \cap B) = 50$  and  $n(B^c) = 350$ , find  $n(B)$  and  $n(U)$ .

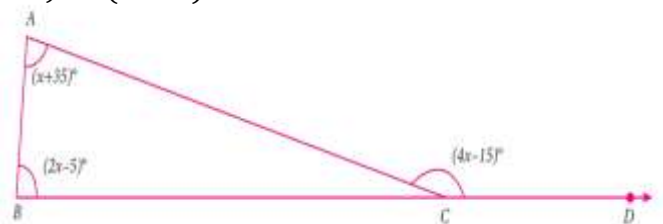
19. Express the decimal expression  $0.\overline{24}$  into rational numbers.
20. Find the value of the following (i).  $(243)^{\frac{2}{5}}$  (ii).  $\left(\frac{64}{125}\right)^{-\frac{2}{3}}$
21. Simplify :  $\sqrt{63} - \sqrt{175} + \sqrt{28}$  .
22. Write the following numbers in decimal form . (i).  $3.459 \times 10^6$  (ii).  $1.00005 \times 10^{-5}$ .
23. Add the following polynomials and find the degree of the resultant polynomial.  
 $p(x) = 6x^2 - 7x + 2$  ,  $q(x) = 6x^3 - 7x + 15$
24. Find the roots of the following polynomials. (i).  $5x - 3$  (ii).  $-7 - 4x = 0$
25. Expand :  $(2x + 3y + 4z)^2$
26. Factorise the following : (i).  $x^2 + 10x + 24$  (ii).  $2a^2 + 9a + 10$
27. Find the GCD of the following :  $2x^2 - 18$  ,  $x^2 - 2x - 3$ .
28. The angles of a triangle are in the ratio 1 : 2 : 3 , find the measure of each angle of the triangle.

### PART – III

**Note : Answer any 10 questions. Question No.42 is compulsory.**

**10 × 5 = 50**

29. (i). If  $n[P(A)] = 256$ , find  $n(A)$ .  
 (ii). Find the symmetric difference between the sets  $P = \{2, 3, 5, 7, 11\}$  and  $Q = \{1, 3, 5, 11\}$ .
30. If  $A = \{b, c, e, g, h\}$ ,  $B = \{a, c, d, g, i\}$ ,  $C = \{a, d, e, g, h\}$ , then show that  
 $A - (B \cap C) = (A - B) \cup (A - C)$ .
31. Verify  $(A \cup B)^c = A^c \cap B^c$  using Venn diagrams.
32. In a group of 100 students, 85 students speak Tamil, 40 students speak English, 20 students speak French, 32 students 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.
33. Represent  $3.\overline{45}$  on the number line upto 4 decimal places.
34. Arrange the surds in descending order :  $\sqrt[3]{5}$ ,  $\sqrt[9]{4}$ ,  $\sqrt[6]{3}$ .
35. If  $x = \sqrt{5} + 2$ , then find the value of  $x^2 + \frac{1}{x^2}$ .
36. Represent the following numbers in scientific notation.  
 (i).  $(300000)^2 \times (20000)^4$  (ii). 2000.57 (iii). 0.0009000002
37. Show that  $(x + 2)$  is a factor of  $x^3 - 4x^2 - 2x + 20$ .
38. Expand : (i).  $(3a + 1)(3a - 2)(3a + 4)$  (ii).  $(3x + 4y)^2$
39. Find the quotient and remainder when  $(4x^3 + 6x^2 - 23x + 18) \div (x + 3)$
40. Factorise :  $x^3 - 5x^2 - 2x + 24$
41. Solve by elimination method :  $2x - y = 3$ ,  $3x + y = 7$
42. Find the all the three angles of the  $\triangle ABC$ .



### PART – IV

**Note : Answer the following questions.**

**2 × 8 = 16**

43. (a). Draw the graph of  $y = 4x - 1$  (OR)  
 (b). Solve graphically :  $x + y = 5$ ,  $2x - y = 4$
44. (a). If  $U = \{a, b, c, d, e, f, g, h\}$ ,  $A = \{b, d, f, h\}$ ,  $B = \{a, d, e, h\}$ , find the following sets.  
 (i).  $A^c$  (ii).  $B^c$  (iii).  $A \cup B^c$  (iv).  $A^c \cap B^c$  (v).  $(A \cup B)^c$  (vi).  $(A \cap B)^c$  (vii).  $(A^c)^c$  (viii).  $(B^c)^c$   
 (OR)  
 (b). Represent  $\sqrt{9.3}$  on a number line.