VIVEKANANDAR TUITION CENTRE - ARAMBAKKAM

MODEL QUARTERLY EXAMINATION - SEPTEMBER 2019

Time Allowed : $2^1/_2$ Hours   **CLASS : 10th**   MATHS   **Maximum Marks : 100**

SECTION – I

Note   : (**1**). **Answer all the 14 questions.**   **$14 \times 1 = 14$**

        (**2**). **Choose the most suitable answer from the given four alternatives and write the option**

         code with the corresponding answer.

1. If the ordered pairs (a+2, 4) and (5 , 2a+b) are equal then (a , b) is

    (1) (2, -2)   (2) (5, 1)   (3) (2, 3)   (4) (3 , - 2)

2. Let A = { 1,2,3,4 } and B = { 4,8,9,10 }. A function $f : A \to B$ given by $f = \{(1,4),(2,8),(3,9),(4,10)\}$ is a

    (1) Many-one function   (2) Identity function   (3) One to one function   (4) Into function

3. If 6 times of 6th term of an A.P is equal to 7 times the 7th term , then the 13th term of the A.P is

    (1). 0   (2) 6   (3) 7   (4) 13

4. Sum of 7 terms of -2 , 6, -18,.......... is

    (1) 1094   (2) -1094   (3) 9041   (4) -9041

5. If ($x - 6$) is the HCF of $x^2 - 2x - 24 \ and \ x^2 - kx - 6$, then the value of k is

    (1) 3   (2) 5   (3) 6   (4) 8

6. The square root of $\dfrac{256x^8 y^4 z^{10}}{25x^6 y^6 z^6}$ is equal to

    (1) $\dfrac{16}{5}\left|\dfrac{x^2 z^4}{y^2}\right|$ (2) $16\left|\dfrac{y^2}{x^2 z^4}\right|$ (3) $\dfrac{16}{5}\left|\dfrac{y}{xz^2}\right|$ (4) $\dfrac{16}{5}\left|\dfrac{xz^2}{y}\right|$

7. The perimeters of two similar triangles ΔABC and ΔPQR are 36 cm and 24 cm respectively. If $PQ = 10$ cm, then the length of AB is

    (1) $6\dfrac{2}{3}$ cm   (2) $\dfrac{10\sqrt{6}}{3}$ cm   (3) $66\dfrac{2}{3}$ cm   (4) 15 cm

8. If in ΔABC , $DE \parallel BC$. $AB = 3.6$ cm, $AC = 2.4$ cm and $AD = 2.1$ cm then the length of AE is

    (1) 1.4 cm   (2) 1.8 cm   (3) 1.2 cm   (4) 1.05 cm

9. If (5 , 7) , (3 , p) and (6 , 6) are collinear , then the value of 'p' is

    (1) 3   (2) 6   (3) 9   (4) 12

10. How many tangents can be drawn to the circle from an exterior point?

    (1) one   (2) two   (3) infinite   (4) zero

11. $\tan\theta\, \text{cosec}^2\,\theta - \tan\theta$ is equal to

    (1) $\sec\theta$ (2) $\cot^2\theta$ (3) $\sin\theta$ (4) $\cot\theta$

   Turn-Over

12. $(1 + \tan\theta + \sec\theta)(1 + \cot\theta - \csc\theta)$ is equal to

(1) 0   (2) 1   (3) 2   (4) -1

13. Variance of first 20 natural numbers is

(1) 32.25   (2) 44.25   (3)   33.25   (4)   30

14. If the mean and coefficient of variation of a data are 4 and 87.5 % , then the standard deviation is

(1) 3.5   (2) 3   (3) 4.5   (4) 2.5

SECTION –II

Note : Answer 10 questions. Question No. 28 is compulsory. $10 \times 2 = 20$

15. Define – Onto function

16. Find the value of k , such that $f \circ g = g \circ f$, where $f(x) = 3x + 2$, $g(x) = 6x - k$

17. Use Euclid's Divisions Algorithm to find the HCF of 340 and 412

18. Find the number of terms in the A.P 3, 6, 9, ………………111.

19. Find the sum $1^2 + 2^2 + 3^2 + \cdots \ldots \ldots \ldots \ldots . +23^2$.

20. Find the LCM of the polynomials $a^2 + 4a - 12 \ and \ a^2 - 5a + 6$ whose GCD is $a - 2$

21. Solve $2x - 3y = 6$, $x + y = 1$

22. Reduce the rational expressions to its lowest form (i) $\dfrac{x - 3}{x^2 - 9}$ (ii) $\dfrac{x^2 - 16}{x^2 + 8x + 16}$

23. If ΔABC is similar to ΔDEF such that BC = 3 cm , EF = 4 cm and area of ΔABC = 54 cm^2 . Find the area of ΔDEF.

24. The vertices of a triangle are $A(-1,3), B(1,-1) \ and \ C(5,1)$. Find the length of the median through the vertex C.

25. Find the slope and y intercept of $\sqrt{3}x + (1 - \sqrt{3})y = 3$.

26. Prove that $\sqrt{\dfrac{1+\cos\theta}{1-\cos\theta}} = \csc\theta + \cot\theta$

27. The standard deviation and mean of a data are 6.5 and 12.5 respectively. Find the co efficient of variation.

28. Threee vertices of a parallelogram of ABCD are A(2, –2), B (8,4), C(5,7) find the 4th vertex.

(OR)

Find the rational form of the number $0.\overline{123}$.

SECTION – III

Note : Answer 10 questions. Question No . 42 is compulsory. $10 \times 5 = 50$

29. Let $f: A \to B$ be a function defined by $f(x) = \dfrac{x}{2} - 1$, where A = { 2, 4, 6, 10, 12 } , B = { 0, 1, 2, 4, 5, 9 }

Represent by (i).set of ordered pairs   (ii). a table   (iii). an arrow diagram   (iv). a graph

30. Find x if $gff(x) = fgg(x),$ given $f(x) = 3x + 1 \ and \ g(x) = x + 3$

31. Find the sum to n terms of the series $5 + 55 + 555 + \cdots\cdots\cdots\cdots\cdots$

32. Rekha has 15 square colour papers of sizes 10 cm, 11 cm , 12 cm , …………24 cm. How much area can be decorated   with these colour papers ?

33. Find the sum of all natural numbers between 602 and 902 which are not divisible by 4.

34. If $ax^4 + bx^3 + 361x^2 + 220x + 100$ is a perfect square , find the value of a and b .

35. Solve : $\dfrac{1}{2x} + \dfrac{1}{4y} - \dfrac{1}{3z} = \dfrac{1}{4}$; $\dfrac{1}{x} = \dfrac{1}{3y}$; $\dfrac{1}{x} - \dfrac{1}{5y} + \dfrac{4}{z} = 2\dfrac{2}{15}$

36. State and prove Thales theorem.

37. Find the area of the quadrilateral formed by the points (8, 6) , (5, 11) , $(-5,12)$ and $(-4, 3)$

38. Find the equation of the median and altitude of ΔABC through A where the vertices are $A(6,2)$, $B(-5,-2)$ and $C(1,9)$.

39. If $\dfrac{\cos\theta}{1+\sin\theta} = \dfrac{1}{a}$, then prove that $\dfrac{a^2-1}{a^2+1} = \sin\theta$

40. If the sum of 10 values data is 60; and $\Sigma\ (x - \bar{x})^2 = 36$ then find Σx^2, $\Sigma(x - 5)^2$.

41. Find the coefficient of variation of 24 , 26 , 33 , 37 , 29 , 31 .

42. Find area of the triangle formed by sides $x + 4y - 9 = 0, 9x + 10y + 23 = 0, 7x + 2y - 11 = 0.$

(OR)

In an A.P $t_{24} = 47\ S_{24} = 576$ then find the common difference and find the sum of first 12 terms.

SECTION – IV

Note : Answer both questions. $2 \times 8 = 16$

43.(a) Construct a triangle similar to a given triangle PQR with its sides equal to $\dfrac{7}{4}$ of the corresponding

   sides of the triangle PQR. (scale factor $\dfrac{7}{4} > 1$)

(OR)

   (b). Draw a triangle ABC of base BC = 5.6 cm , $\angle A = 40°$ and the bisector of $\angle A$ meets BC at D such that CD= 4 cm

44. (a) Draw the graph of $y = x^2 - 5x - 6$ and hence solve $x^2 - 5x - 14 = 0$

(OR)

   (b). Sum of 3 numbers is 10. Sum of the first number , twice the second number and 3 times the third is 29 and the sum of first , four times the second and nine times the third is 43. Find the numbers.

**************** All The Best **************