# **MODEL QUESTION PAPER – QUARTERLY PORTION 2019-20 X STD -- MATHEMATICS**

Time Allowed : 15 mins + $2\frac{1}{2}$	 T	Maximum Marks : 100				
Instructions : (1) .Check the	question paper for fairnes	s of printing If there is any lack	of fairness , inform			
the Hall S	upervisor immediately					
(2). Use <b>Blue c</b>	<b>r Black</b> ink to write and u	underline and pencil to draw dia	agrams.			
Note : This question	paper contains four parts					
	SECTION - I	l				
Note : (1) Answer all the 14 questions.			$14 \times 1 = 14$			
(2). Choose the m	ost suitable answer from	the given four alternatives an	d write the option			
code with th	e corresponding answer					
1.If the ordered pairs (a+2,	4 ) and (5 <i>,</i> 2a+b ) are eq	ual 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 = $\frac{1}{2}$	{ 4,8,9,10 }. A function f:.	$A \rightarrow B$ 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 6 <sup>th</sup> term of an	A.P is equal to 7 times the	e 7 <sup>th</sup> term , then the 13 <sup>th</sup> term o	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. If the polynomial $16x^4 - 2$	$24x^3 + 41x^2 - mx + 16$	be a perfect square , then the	value of 'm' s			
(1) 12	(2) -12	(3) 24	(4) -24			
7. In the given figure , PR = 2	6 cm , QR = 24 cm , ∠ $PAQ$	$= 90^{\circ}$ , PA = 6 cm and QA = 8 c	cm .Find $\angle PQR =$			
R	A Poo					

(4) 90° (1) 80° (2) 85° (3) 75°

8. $\Delta$ ABC is such that AB = 3 cm , BC = 2 cm and CA = 2.5 cm.If $\Delta ABC \sim \Delta DEF$ and EF = 4 cm then perimeter							
of $\Delta DEF$ is							
(1) 7.5 cm	(2) 15 cm	(2) 15 cm (3) 22.5 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.The points A( 4 , 4 ), B( 3, 5 ) , C( -1 , -1 ) form							
(1) right triangle	(2) isosceles triangle	(3) equilateral triangle	(4) None of these				
11. $\tan\theta \operatorname{cosec}^2\theta - \tan\theta$ is equal to							
(1) $\sec\theta$	(2) $\cot^2 \theta$	(3) sin <i>θ</i>	(4) $\cot \theta$				
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) 35	(2) 3	(3) 45	(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  $1^2 + 2^2 + 3^2 + \cdots + 23^2$ .
- 20. Find the LCM of the polynomials  $a^2 + 4a 12$  and  $a^2 5a + 6$  whose GCD is a 2
- 21. Write down the quadratic equation whose sum and product of the roots are 9, 14.
- 22. Five years ago, father was thrice as old as son. Ten years later, father will be twice as old as son. Find the age of father and son.
- 23. If  $\triangle ABC$  is similar to  $\triangle DEF$  such that BC = 3 cm , EF = 4 cm and area of  $\triangle ABC$  = 54 cm<sup>2</sup>. Find the area of  $\triangle DEF$

- 24. Show that the given points are collinear (-3, -4), (7, 2) and (12 5)
- 25 Find the equation of a straight line perpendicular to the line  $y = \frac{4}{3}x 7$  and passing through the point
  - (7,-1).
- 26. Prove that  $\sec^6 \theta = \tan^6 \theta + 3 \tan^2 \theta \sec^2 \theta + 1$
- 27. The standard deviation and mean of a data are 6.5 and 12.5 respectively. Find the co efficient of variation.
- 28.Three vertices of a parallelogram ABCD are (1, 2), (4, 3), (6, 6). Find the 4<sup>th</sup> vertex.

#### SECTION – III

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

- 29. Let  $f: A \rightarrow B$  be a function defined by  $f(x) = \frac{x}{2} 1$ , 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  $5 + 55 + 555 + \cdots \dots \dots \dots \dots$
- 33. If the sum of first 7 terms of an A.P is 49 and that of first 17 terms is 289. Find the sum of n terms.
- 34. If  $ax^4 + bx^3 + 361x^2 + 220x + 100$  is a perfect square , find the value of a and b
- 35. Find the GCD of  $6x^3 30x^2 + 60x 48$  and  $3x^3 12x^2 + 21x 18$ .
- 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  $\triangle ABC$  through A where the vertices are A(6,2),

$$B(-5,-2)$$
 and  $C(1,9)$ .

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

40. 48 students were asked to write the total number of hours per week they spent on watching television. with this information find the standard deviation of hours spent for watching television.

x	6	7	8	9	10	11	12
f	3	6	9	13	8	5	4

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.

#### **SECTION – IV**

#### Note : Answer both questions.

43.(a) Construct a triangle similar to a given triangle PQR with its sides equal to  $\frac{7}{4}$  of the corresponding sides of the triangle PQR. (scale factor  $\frac{7}{4} > 1$ ) ( OR )

 $2 \times 8 = 16$ 

- (b). Draw a triangle ABC of base BC = 5 6 cm ,  $\angle A = 40^{\circ}$  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  $x^2 5x 14 = 0$

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( OR )
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(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.

PREPARED BY : M.MOHAMED RAFFICK.M.Sc., B.Ed.. B.T.ASST , GHSS, THALUDALI , VILLUPURAM DISTRICT.