## UNIT TEST - 3 (Algebra, Graphs, Practical geometry) MATHEMATICS

CLASS: X standard			Marks Time	: 100 : 2.30 hours	
		PART-I [Marks 14]			
Answer all the 14 questions			-	14x1=14	
1. A system of thr	ee linear equation	s in three variables i	s inconsistent if thei	r planes	
a) Intersect only at a point		b) i	ntersect in a line	X	
c) Coincides with each other		d) d	o not intersect	0	
2. If ( <i>x</i> -6) is the	HCF of and hen th	ne value of $k$ is			
a) 3	b) 5	c) 6	d) 8		
3. $y^2 + 1/y^2$ is no	t equal to		0		
a) $\frac{y^4+1}{y^2}$	b) $(y + 1/y)^2$	c) $(y - 1/y)^2 + 2$	d) (y + 1/y	y) <sup>2</sup> -2	
4. The square ro	ot of 361x4v2				
_	(b) $19x^4y^2$	(c) 19xy <sup>2</sup>	(d) 19xy		
5. Which of the fo	ollowing should be	added to make x4+64	l perfect square		
(a)4x <sup>2</sup>	(b)16x <sup>2</sup>	c)8x <sup>2</sup>	d) -8x <sup>2</sup>		
6. The solution of	$(2x-1)^2 = is equal t$	0			
(a) -1	(b)2		d)none of thes	se	
7. If a polynomia times(odd/even	al is a perfect squa	are then, its factors	will be repeated _	number of	
(a)1	(b) 2	(c) 3	(d) 4		
8. The values of a) 100, 120		$4x^3+76x^2+ax+bis a$ (c) -120, 100		•	
9. Graph of a line	ear polynomial is	a			
-		(c) parabola	(d) hyperbo	la	
10. If <i>A</i> is a 2 x 3	matrix and $B$ is a	3 x 4 matrix, how	many columns doe	s <i>AB</i> have	
(a) 3 Kindly	(b) 4 y send me your key a	(c) 2 answers to our email i	(d) 5 d - padasalai.net@gar	nil.com	

11. If number of columns and rows are not equal in a matrix then it is sale to be a  (a) diagonal matrix  (b) rectangular matrix  (c) square matrix  (d) identity matrix				
12. For the given matrix $A = \begin{bmatrix} 1 & 5 & 7 & 9 \\ 5 & 7 & 2 & 1 \\ 2 & 4 & 8 & 2 \end{bmatrix}$ the order of matrix $A^T$				
a) 3 x 2 b) 2 x 3 c) 3 x 4 d) 4 x 3				
13. Transpose of a column matrix is (a) unit matrix (b) diagonal matrix (c) column matrix (d) row matrix				
14. A square matrix in which elements in the leading diagonal are all "1" and rest are all zero is called				
a) unit matrix b) diagonal matrix c) zero matrix d) scalar matrix				
PARTS-II [MARKS: 20] Answer all the questions [Question number 28 is compulsory] 10x2=20				
15. Solve $2x-3y=6$ , $x+y=1$ 16. Find the LCM of $p^2-3p+2$ , $p^2-4$ 17. Reduce the rational expressions to its lowest form $9x^2+81x$ $x^3+8x^2-9x$				
18. Find the excluded values of the following expressions t				
19. Simplify $x^3 + y^3$ $x-y   y-x$ $t^2-5t+6$				
20. Write down the quadratic equation in general form for which sum and product of the roots are given below $5/3$ , $4$				
21. Solve the quadratic equations by factorization method $4x^2-7x-2=0$				
22. Solve the quadratic equations by completing the square method $x^2-3x-2=0$				
23. Determine the nature of roots for the quadratic equations $9x^2-24x+16=0$				
24. Define diagonal Matrix				
25. Constru <b>ictual 3 x 3 uch atrixo w ho senes enrents ar e</b> mai i i (i - 2ja) dasalai.net@gamil.com				

Find the value of 3A-9B

26. If 
$$A = \begin{bmatrix} 0 & 4 & 9 \\ 8 & 3 & 7 \end{bmatrix}$$
 and  $B = \begin{bmatrix} 7 & 3 & 8 \\ 1 & 4 & 9 \end{bmatrix}$ 

27. Verify that 
$$A^2=I$$
 when  $A=\begin{bmatrix} 5 & -4 \\ 6 & -5 \end{bmatrix}$ 

28. Find the zeroes of the quadratic expression  $x^2+8x+12$ 

## PARTS-III [MARKS: 50]

Answer all the questions [Question number 42 is compulsory] 10x5=50

- 29. Solve the system of linear equations in three variables 3x-2y+z=2, 2x+3y-z=5, x+y+z=6
- 30. Discuss the nature of solutions of the following system of equations 3x-y+z=1, 2x-y+2z=1, -x-y+z=2
- 31. Find the GCD of the polynomials  $x3+x^2-x+2$  and  $2x^3-5x+5x-3$

32. Simplify 
$$\frac{1}{x^2-5x+6}$$
 +  $\frac{1}{x^2-3x+2}$  -  $\frac{1}{x^2-8x+15}$ 

33. If A = 
$$2x+1$$
 and B =  $2x-1$  find 1 -  $2B$   
 $2x-1$   $2x+1$  A-B  $A^2-B^2$ 

34. If 
$$A = \underbrace{x}_{X+1}$$
 and  $B = \underbrace{1}_{x+1}$  find  $\underbrace{(A+B)^2 + (A-B)^2}_{A \div B} = \underbrace{2(x^2+1)}_{x(x+1)^2}$ 

- 35. Find the square root of  $(6x^2+x-1)(3x^2+2x-1)(2x^2+3x+1)$
- 36. Find the square root of the following polynomials by division method

$$\frac{x^2 - 10x}{y^2}$$
 +27 -  $\frac{10y}{x}$  + $\frac{y^2}{x^2}$ 

- 37. Find the values of m and n if the polynomials are perfect squares  $x^4-8x^3+mx^2+nx+16$
- 38. A passenger train takes 1 hr more than an express train to travel a distance of 240 km from Chennai to Virudhachalam. The speed of passenger train is less than that of an express train by 20 km per hour. Find the average speed of both the trains.

39. If 
$$A = \begin{bmatrix} 5 & 2 & 9 \\ & & \\ 1 & 2 & 8 \end{bmatrix}$$
  $B = \begin{bmatrix} 1 & 7 \\ 1 & 2 \\ 5 & -1 \end{bmatrix}$  show that  $(AB)^{T} = B^{T}A^{T}$ 

40. If A = Kindly send me show that A<sup>2</sup> = A+70 = mail id - padasalai.net@gamil.com

41. If 
$$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$$
 and  $I_2 = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$  then show that  $A^2$ -(a + d)  $A$ = (bc- ad)  $I_2$ 

42. If  $\alpha$ ,  $\beta$  are the roots of the equation  $3x^2+7x-2=0$  find the values of

i) 
$$\alpha + \beta$$
 ii)  $\alpha^2 + \beta^2$   $\alpha$   $\beta$   $\alpha$ 

## PARTS-IV [MARKS: 16]

## **Answer both questions**

2x8=16

43. a) Draw a circle of radius 4 cm. At a point L on it draw a tangent to the circle using the alternate segment

- b) Draw a triangle *ABC* of base *BC* = 8 cm,  $A = 60^{\circ}$  and the bisector of  $\Phi A$  meets *BC* at *D* such that BD = 6 cm.
- 44. a) Draw the graph of  $y=2x^2$  and hence use it to solve  $2x^2-x-6=0$  (or)
  - b) Draw the graph of  $y=x^2-4$  and hence use it to solve  $x^2-x-12=0$

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