DHIVYA MATRIC HR SEC SCHOOL, CHETPET.

Mathematics (units 1-3)

I CHOOSE THE BEST:–

1. 1, 0.1 , 0.01 , ... then it's next number is _____ a. 0.001 b. 0.0001 c. 0.01 d. none
2. If A={a, b, p}, n(A×B)=9 then n(B) is ____ a. 2 b. 5 c. 3 d. 1
3. Let $f(x)=\sqrt{1+x^2}$ then ____ a. $f(xy)=f(x).f(y)$ b. $f(xy)\geq f(x).f(y)$ c. $f(xy)\leq f(x).f(y)$
4. If the HCF of 65 and 117 is expressible in the form of $65m-117$, then the value of m is _____ a. 4 b. 2 c. 1 d. 3
5. Which of the following can be calculated from the given matrices $A=\begin{bmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{bmatrix}$

$B=\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{bmatrix}$, (*i*) A^2 (*ii*) B^2 (*iii*) AB (*iv*) BA

a. (i) and (ii) only b. (ii) and (iii) only c. (ii) and (iv) only d. all of these

6. Graph of a linear equation is a ____ a. straight line b. parabola c. circle d. hyperbola

II . ANSWER ANY 9 BUT QUESTION NO. 11 IS COMPULSORY:–

7. Let A={1, 2, 3, 4, ..., 45} and R be the relation defined as " is square of a number " on A. Write R as a subset of A×A. Also, find the domain and range of R.
8. If 3+k, 18−k , 5k+1 are in A.P, then find K.
9. If the first term of an infinite G.P. is 8 and its sum to infinity is $\frac{32}{3}$ then find the common ratio.
10. Find *fog* and *gof*. if $f(x)=2x^2$ and $g(x)=\frac{1}{3x}$.
11. Find $\frac{1}{A+B}$, if $A=\frac{2x+1}{2x-1}$, $B=\frac{2x-1}{2x+1}$.
12. Determine the nature of the roots for $\sqrt{2}\,t^2-3t+3\sqrt{2}=0$.
13. Solve by factorization method: $2x^2-2\sqrt{6}x+3=0$.
14. If $A=\begin{pmatrix} \cos\theta & -\sin\theta \\ -\sin\theta & \cos\theta \end{pmatrix}$, prove that $AA^T=I$.

15. Construct a 3×3 matrix whose elements are given by $a_{ij}=|i-2j|$.

16. Find the excluded values , if any of the expression $\dfrac{x^3-27}{x^3+x^2-6x}$.

17. Find the sum of $1+3+5+...+55$.

18. Find the least positive value of x such that $5x \equiv 4 \pmod 6$.

III. ANSWER ANY 7 BUT QUESTION NO.28 COMPLUSORY:

19. The sum of first n, $2n$ and $3n$ terms of an A.P are S_1, S_2 and S_3 respectively.

20. Find the three terms. In a G.P the product of three consecutive terms is 27 and the sum of the product of two terms taken at a time is $\dfrac{57}{2}$.

21. Let A={1, 2, 3, 4} and B={2,5,8,11,14} be two sets. Let f:A→B be a function given by $f(x)=3x-1$. Reprsent this function (i) by arrow diagram (ii) in a table form (iii) as a set of ordered pairs (iv) in a graphical form

22. Solve $\dfrac{x}{2}-1=\dfrac{y}{6}+1=\dfrac{z}{7}+2$; $\dfrac{y}{3}+\dfrac{z}{2}=13$.

23. If the roots of the equation $(c^2-ab)x^2-2(a^2-bc)x+b^2-ac=0$ are real and equal. Prove that either a=0 (or) $a^3+b^3+c^3=3abc$

24. If $A=\begin{pmatrix}1 & -1 & 2\end{pmatrix}$, $B=\begin{bmatrix}1 & -1\\ 2 & 1\\ 1 & 3\end{bmatrix}$ and $C=\begin{bmatrix}1 & 2\\ 2 & -1\end{bmatrix}$. ST., (AB)C = A(BC).

25. Find the values of x, y, z if $\begin{bmatrix}x-3 & 3x-z\\ x+y+7 & x+y+z\end{bmatrix}=\begin{bmatrix}1 & 0\\ 1 & 6\end{bmatrix}$.

26. A passenger train takes 1 hr. more than an express train to travel a distance of 240km from Chennai to Thiruvannamalai. 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.

27. (i) Find the domain of the function $f(x)=\sqrt{1+\sqrt{1-\sqrt{1-x^2}}}$

(ii) State whether the function is bijective or not. Justify your answer for $f:\mathrm{R}\to\mathrm{R}$ defined by $f(x)=3-4x^2$.

28. Find the square root of the expression $\dfrac{4x^2}{y^2}+\dfrac{20x}{y}+13-\dfrac{30y}{x}+\dfrac{9y^2}{x^2}$

V. ANSWER THE FOLLOWING :–

29. Draw the graph of $y=x^2-4x+3$ and use it to solve $x^2-6x+9=0$. [***or***]

A bus is travelling at uniform speed of 50 km/hr. Draw the distance – time graph and hence find (i) the constant of variation (ii) how far will it travel in 90 minutes? (iii) the time required to cover a distance of 300 km from the graph?

30. Construct a ΔPQR in which PQ = $8cm$, $\angle$R=60^o and the median RG from R to PQ is $5.8cm$. Find the length of the altitude from R to PQ. [***or***]

Draw a tangent to the circle from the point P having radius 3.6 cm, and centre at O. Point P is at a distance 7.2 cm from the centre.

----------ALL THE BEST----------