Padasalai's Telegram Groups!

(தலைப்பிற்கு கீழே உள்ள லிங்கை கிளிக் செய்து குழுவில் இணையவும்!)

- Padasalai's NEWS - Group
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- Padasalai's Channel - Group
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- Lesson Plan - Group
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- 12th Standard - Group
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- 9th Standard - Group
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- 6th to 8th Standard - Group
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I Choose the best answer: [20×1=20]

1. If $A=\{(x,y): y=e^x, x\in R\}$ and $B=\{(x,y): y=e^{-x}, x\in R\}$ then $n(A\cap B)$ is ___ a) Infinity b) 0 c) 1 d) 2

2. If $n((A\times B)\cap(A\times C))=8$ and $n(B\cap C)=2$, then $n(A)$ is ___ a) 6 b) 4 c) 8 d) 16

3. For non-empty sets A and B, if $A\subset B$ then $(A\times B)\cap(B\times A)$ is equal to ___ a) $A\cap B$ b) $A\times A$ c) $B\times B$ d) none of these.

4. The number of relations on a set containing 3 elements is ___ a) 9 b) 81 c) 512 d) 1024

5. The range of the function $\frac{1}{1-2\sin x}$ is ___ a) $(-1,\frac{1}{3})$ b) $(-\infty,-1)\cup(\frac{1}{3},\infty)$ c) $[-1,\frac{1}{3}]$ d) $(-\infty,-1]\cup[\frac{1}{3},\infty)$

6. The rule $f(x)=x^2$ is a bijection if the domain and co-domain are given by, a) R, R b) $R, (0,\infty)$ c) $(0,\infty), R$ d) $[0,\infty), [0,\infty)$

7. Let $f: R\to R$ be defined by $f(x)=1-|x|$. Then the range of f is ___ a) R b) $(1,\infty)$ c) $(-1,\infty)$ d) $(-\infty,1]$

8. If $A\subseteq B$ then $A\setminus B$ is ___ a) B b) A c) ϕ d) $\frac{B}{A}$

9. Let $f: R\to R$ be given by $f(x)=x+\sqrt{x^2}$ is ___ a) Injective b) surjective c) bijective d) none of these.

10. If $f(x)=2x-3$ and $g(x)=x^2+x-2$ then $gof(x)$ is ___ a) $2(2x^2-5x+2)$ b) $2x^2-5x-2$ c) $2(2x^2+5x+2)$ d) $2x^2+5x-2$

11. If $|x+2|\le 9$, then x belongs to ___ a) $(-\infty,-7)$ b) $[-11,7]$ c) $(-\infty,-7)\cup[11,\infty)$ d) $(-11,7)$

12. If $\frac{|x-2|}{x-2}\ge 0$, then x belongs to ___ a) $[2,\infty)$ b) $(2,\infty)$ c) $(-\infty,2)$ d) $(-2,\infty)$

13. The solution of $5x-1<24$ and $5x+1>-24$ is ___ a) (4,5) b) (-5,-4) c) (-5,5) d) (-5,4)

14. Find a so that the sum and product of the roots of the equation $2x^2+(a-3)x+3a-5=0$ are equal is ___
a) 1 b) 2 c) 0 d) 4

15. The number of solutions of $x^2+|x-1|=1$ is ___
a) 1 b) 0 c) 2 d) 3

16. The number of roots of $(x+3)^4+(x+5)^4=16$ is ___
a) 4 b) 2 c) 3 d) 0

17. If $\frac{1-2x}{3+2x-x^2}=\frac{A}{3-x}+\frac{B}{x+1}$ then the value of $A+B$ is ___
a) $-1/2$ b) $-2/3$ c) $1/2$ d) $2/3$

18. If $x<7$, then ___ a) $-x<-7$ b) $-x\leq -7$ c) $-x>-7$ d) $-x\geq -7$

19. $\sqrt[4]{11}$ is equal to ___ a) $\sqrt[8]{11^2}$ b) $\sqrt[8]{11^4}$ c) $\sqrt[8]{11^8}$ d) $\sqrt[8]{11^6}$

20. $(\sqrt{5}-2)(\sqrt{5}+2)$ is equal to ___ a) 1 b) 3 c) 23 d) 21

II Answer the following questions (Any 7) [7 x 2 = 14]

Question number 30 is compulsory.

21. Find the number of subsets of A if
$A=\{x: x=4n+1, 2\leq n\leq 5, n\in N\}$

22. If $n(P(A))=16$, $n(A\cup B)=15$ and $n(P(B))=32$ then find $n(A\cap B)$.

23. Prove that the relation "friendship" is not an equivalence relation on the set of all people in chennai.

24. Find the domain of $f(x)=\frac{1}{1-2\cos x}$

25. Let f and g be the two functions from R to R defined by $f(x)=3x-4$ and $g(x)=x^2+3$. Find "$g\circ f$" and "$f\circ g$"

26. Construct a quadratic equations with roots 7 and -3

27. Find the real roots of $x^4=16$

28. Solve $x=\sqrt{x+20}$ for $x\in R$

29. Discuss the nature of roots of $9x^2+5x=0$

30. Solve $3|x-2|+7=19$ for x.

III Answer the following questions: (Any 7) [7×3=21]

Question number 40 is compulsory.

31. If A×A has 16 elements, $S=\{(a,b)\in A\times A : a<b\}$; $(-1,2)$ and $(0,1)$ are two elements of S, then find the remaining elements of S.

32. In the set Z of integers, define mRn if $m-n$ is divisible by 7. prove that R is an equivalence relation.

33. If $f,g : R\to R$ are defined by $f(x)=|x|+x$ and $g(x)=|x|-x$ find gof and fog.

34. From the curve $y=\sin x$, draw $y=\sin|x|$
{Hint: $\sin(-x)=-\sin x$}

35. Solve $-3|x|+5\leq -2$ and graph the solution set in a number line.

36. solve $-2x\geq 9$ when (i) x is a real number. (ii) x is an integer (iii) x is a natural number.

37. write $f(x)=x^2+5x+4$ in completed square form.

38. Factorize: x^4+1 (Hint: Try completing the square)

39. Resolve into partial fractions: $\frac{3x+1}{(x-2)(x+1)}$

40. If $A=\{x : x=3n, n\in Z\}$ and $B=\{x : x=4n, n\in Z\}$ then find $A\cap B$.

IV Answer all the questions [7×5=35]

41. Let $X=\{a,b,c,d\}$ and $R=\{(a,a),(b,b),(a,c)\}$. write down the minimum number of ordered pairs to be included to "R" to make it (i) reflexive (ii) symmetric (iii) transitive (iv) equivalence.

(or)

If $f : R\to R$ is defined by $f(x)=2x-3$ prove that f is bijection and find its inverse.

42. The distance of an object falling is a function is a function of time t and can be expressed as $s(t)=-16t^2$ Graph the function and determine if it is one-to-one.

(or)

From the curve $y=|x|$ draw (i) $y=|x-1|$ (ii) $y=|x+1|-1$ (iii) $y=|x+2|-3$

43. A simple cipher takes a number and codes it, using the function $f(x) = 3x - 4$. Find the inverse of this function, determine whether the inverse is also a function and verify the symmetrical property about the line $y = x$ (by drawing the lines)

(or)

From the curve $y = x$ draw (i) $y = -x$ (ii) $y = 2x$ (iii) $y = x + 1$ (iv) $y = \frac{1}{2}x + 1$ (v) $2x + y + 3 = 0$

44. Find all pairs of consecutive odd natural numbers both of which are larger than 10 and their sum is less than 40.

(or)

If the difference of the roots of the equations $2x^2 - (a+1)x + a - 1 = 0$ is equal to their product, then prove that $a = 2$.

45. Solve $2x^2 + x - 15 \leq 0$

(or)

If $x^2 + x + 1$ is a factor of the polynomial $3x^3 + 8x^2 + 8x + a$, then find the value of "a".

46. Find all the values of x that satisfies the inequality $\frac{2x - 3}{(x-2)(x-4)} < 0$

(or)

Resolve into partial fraction $\frac{x^3 + 2x + 1}{x^2 + 5x + 6}$

47. Determine the region in the plane determined by the inequalities: $2x + 3y \leq 6$; $x + 4y \leq 4$; $x \geq 0$; $y \geq 0$

(or)

Solve the linear inequalities and exhibit the solution set graphically:

$x + y \geq 3$; $2x - y \leq 5$; $-x + 2y \leq 3$.

$x^2 + x + 1$