MATHS

BOOKS - DEEPTI MATHS (TELUGU ENGLISH)

RELATIONS

Exercise

1. If A ={1,2,3},B={x,y} then $A \times B$=

A. {1,2,3,X,Y}

B. {(1,X),(2,Y),(1,Y)}

C. {(X,A),(Y,B),(X,3)}

D. {(1,X),(1,Y),(2,X),(2,Y),(3,X),(3,Y)}

Answer: D

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2. If A= $\left\{2\frac{x}{x} \in N \text{ and } x < 3\right\}, B = \left\{x / x^2 - 4x + 3 = 0 \text{ and } x > 1\right\}$ then A x B =

A. {(4,3),(2,3)}

B. {(2,4),(2,3)(4,3)}

C. {(1,4),(2,3),(2,2)}

D. {(1,2),(1,3)(2,3)}

Answer: A

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3. If A= {1,2,3},B={x} then $(A \times B) \cup (B \times A)$=

A. {(1,X),(2,X),(3,X)}

B. {(X,1),(X,2),(X,3)}

C. {(1,X),(2,X),(3,X),(X,1),(X,2)(X,3)}

D. NONE

Answer: C

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4. If two sets P and Q ,n(P)=5 ,n(Q)=4 then n(P $\times$ Q)=

A. 20

B. 9

C. 25

D. $5/4$

Answer: A

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5. If A={1,2,3,4,5},B ={p,q,r,s} then n(A $\times$ B) =

A. 8

B. 4

C. 20

D. 5^4

Answer: C

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6. If A= {1,3,5,7}B={a,b,c},then n(A $\times$ b)=

A. 3

B. 4

C. 12

D. 7

Answer: C

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7. If A={1,2,3,4,5},B ={a,b,c} , then n(B $\times$ A)=

A. 5

B. 3

C. 15

D. 125

Answer: C

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8. If $n(A \times B) = 15, n(A) = 3$ then n(B)=

A. 12

B. 5

C. 45

D. 3

Answer: B

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9. Let A and B be two sets containing 2 elements and 4 elements respectively the number of subsets of A $\times$ B having 3 or more elements is

A. 219

B. 211

C. 256

D. 220

Answer: A

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10. If n(A)=n then n{(x,y,z),x,y,z $\in A, x \neq y, y \neq z, z \neq x$}=

A. n^3

B. $n(n-1)^2$

C. $n^2(n-2)$

D. $n^3 - 3n^2 + 2n$

Answer: D

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11.

$A = \{(x, y) : y : y = e^x, x \in R\}, B = \{(x, y) : y = e^{-x}, x \in R\}$

then

A. $A \cup B = \varnothing$

B. $A \cup B \neq \varnothing$

C. $A \cup B = R^2$

D. none

Answer: B

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12.

$A = \{(x, y) : y = e^x, x \in R\}, B = \{(x, y) : y = x, x \in R\}$

then

A. $B \subset A$

B. $A \subset B$

C. $A \cap B = \varnothing$

D. $A \cup B = A$

Answer: C

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13. Let X ={1,2,3,4,5} then the number of different ordered pairs (Y,Z) that can be formed such that $Y \subset X, Z \subset X$ and $Y \cap Z$ is empty is

A. 2^5

B. 5^3

C. 5^2

D. 3^5

Answer: D

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14. If A={2,3,5},B={4,6,8}, then the relation from A in to B is

A. {(2,4),(3,5),(5,6)}

B. {(2,4),(5,8),(6,5)}

C. {(2,4),(3,6),(2,6)}

D. {(2,5),(3,6)}

Answer: C

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15. Domain of { (1,x),(2,y),(3,x),(4,z)}is

A. {1,2,3,4}

B. {x,y,z}

C. {1,2,4,x,y,z}

D. {1,x}

Answer: A

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16. Range of {(1,x),(1,y),(2,x),(2,y),(3,z)} is

A. {1,2,3}

B. {x,y,z}

C. {1,x}

D. {1,2,3,x,y,z}

Answer: B

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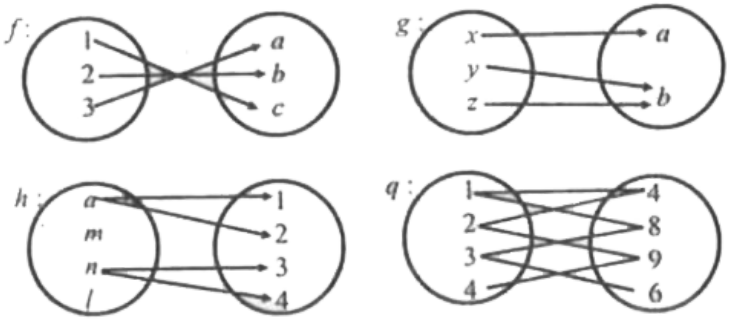
17. Inverse relation of $\{(1, 2), (1, 3), (2, 3)\}$ is



A. {(1,2),(1,3),(2,3)}

B. {(2,1),(3,1),(3,2)}

C. $\varnothing$

D. {(-1,2,(-1,-3),(-2,-3)}

Answer: B

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18. Which of the above is many to many relation ?

A. f

B. g

C. h

D. q

Answer: D

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19. Which of the above is one to one relation ?

A. f

B. g

C. h

D. q

Answer: A

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20. Which of the above is one to many relation ?

If A= {1,2,3},B={a,b,c},f={(1,a),(1,b),(1,c)},g={(1,a),(3,c),(2,b)},h={(1,a),(2,b),(3,a)},q={(1,a),(2,a),(3,b),(1,b),(3,a)} then

A. f

B. g

C. h

D. q

Answer: A

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21. Which of the above is one to ne relation ?

A. f

B. g

C. h

D. q

Answer: B

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22. Which of the above is many to many relation ?

A. f

B. g

C. h

D. q

Answer: A

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23. Which of the above is many to one relation

A. f

B. g

C. h

D. q

Answer: C

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24. Which of the above is many to many relation ?

A. f

B. g

C. h

D. q

Answer: D

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25. If A={1,2,3},f={(1,1),(1,2),(2,1)} then on A, f is

A. reflexive

B. symmetric

C. antisymmetric

D. equivalence

Answer: B

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26. If A={1,2,3},f={(1,1),(2,2),(3,3)} then on A, f is

A. reflexive

B. symmetric

C. antisymmetric

D. equivalence

Answer: A

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27. Let

$R = \{(3, 3), (6, 6), (9, 9), (12, 12), (6, 12), (3, 9), (3, 12), (3, 6)\}$

be a relation on the set A= {3,6,9,12}` The relation is

A. reflexive and transitive only

B. reflexive only

C. an equivalence relation

D. reflexive and symmetric only

Answer: A

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28. The relation $\perp$ is

A. reflexive

B. symmetric

C. transitive

D. equivalence

Answer: B

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29. The relation $>$ is

A. reflexive

B. symmetric

C. transitive

D. equivalence

Answer: C

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30. The relation II is

A. reflexive

B. symmetric

C. transitive

D. equivalence

Answer: D

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31. For , n m $\in$ N,n I m means that n is a factor of m the relation is

A. reflexive and symmetric

B. transitive and symmetric

C. reflexive and symmetric

D. R is reflexive and transitive

Answer: D

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32. Let x,y $\in$ Z and suppose that a relation R on Z is defined by x R y if and only if $x \leq y$ then

A. R is partial order

B. R is an equivalence relation

C. R is reflexive and symmetric

D. R is symmetric and transitive

Answer: A

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33. The relation " son of " is

A. reflexive

B. symmetric

C. transitive

D. none

Answer: D

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34. In the set of all triangles "similarity is

A. reflexive

B. symmetric

C. transitive

D. equivalence

Answer: D

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35. A and B are two sets having 3 and 4 elements respectively and having 2 elements in common The number of relation which can be defined from A to B is

A. 2^5

B. $2^{10} - 1$

C. $2^{12} - 1$

D. none of these

Answer: D

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36. If the relation R:$A \to B$ where $A = \{1, 2, 3, 4\}$ and B= {1,3,5} is defined by $R = \{(x, y), x < y, x \in A, y \in B\}$ then ROR^{-1} is

A. {(1,3),(1,5),(2,3),(2,5),(3,5),(4,5)}

B. {(3,1),(5,1),(2,3),(2,5),(3,5),(4,5)}

C. {(3,3),(3,5),(5,3),(5,5)}

D. none of these

Answer: C

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37. Let R={(x,y):x,y in A,x+y=5} where A= { 1,2,3,4,5} then

A. R is not reflexive,but symmetric and not transitive

B. R is an equivalence symmetric but transitive

C. R is not reflexive not symmetric but bit transitive

D.

Answer: A

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38. Let R be relation on a set A such that R=R^{-1} then R is

A. reflexive

B. symmetric

C. transitive

D. an equivalence relation

Answer: B

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39. For x,y $\in$ R define a relation R by x R y if and only if x-y + $\sqrt{2}$ is an irrational number .Then R is

A. Reflexive

B. Symmetric

C. Transitive

D. none of these

Answer: A

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40. If R and S are two symmetric relation then

A. R_oS is symmetric relation

B. S_oR is a symmetric relation

C. R_oS^- is symmetric relation

D. R_oS is a symmetric relation if and onlyb if R_oSS_oR

Answer: D

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41. f is a relation on the set R of real numbers defined (a,b) $\in f \to 1 + ab > 0$ then f is

A. transitive , reflexive but not symmetric

B. reflexive symmetric but not transitive

C. reflexive symmetric transitive

D. not reflexive not symmetric not transitive

Answer: B

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42. Let W denote the words in the english dicitionary define the relation R by $R: \{(x, y) \in W \times W$I the words x and y have at least one letter in common }Then R is

A. reflexive symmetric and transitive

B. reflexive not symmetric and transitive

C. not reflexive symmetric and transitive

D. reflexive symmetric and not transitive

Answer: D

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43. If $A = \{1, 2, 3\}$ the number of reflexive relations in A is

A. 9

B. 3

C. 64

D. 25

Answer: C

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44. If A={1,2,3} the number of symmetric realtions in A is

A. 3

B. 8

C. 324

D. 64

Answer: D

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45. Let $R = \{(1, 3), (4, 2), (2, 4), (2, 3), (3, 1)\}$ be a relation on the set $A = \{1, 2, 3, 4\}$. The relation R is

A. a function

B. reflexive

C. not symmetric

D. transitive

Answer: D

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46. The set S={1,2,3....12} is to be partitioned into three sets A,BC of equal size Thus $A \cup B \cup C = S, A \cap B = B \cap C = A \cap C = \varphi$ the number of ways to partitions S is

A. $\frac{12!}{3!(4!^3)}$

B. $\frac{12!}{3!(4!^4)}$

C. $\frac{12!}{4!^3}$

D. $\frac{12!}{3!^4}$

Answer: C

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47. Let R be the relation on the set R of all real numbers defined by a R bif Ia-bI $\leq$ 1Then R is

A. reflexive and symmetric

B. symmetric only

C. transitive only

D. anti-symmetric only

Answer: A

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48. The relation "less than " in the set of natural numbers is

A. only symmetric

B. only transitive

C. only reflexive

D. equivalence relation

Answer: B

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49. Let N denote the set of all natural numbers and R be the relation on $N \times N$ defined by (a,b)R (c,d) if ad(b+c)=bc(a+d)

then R is

A. symmetric only

B. reflexive only

C. transitive only

D. an equivalence relation

Answer: D

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