MATHEMATICS LECTURES FOR IIT-JEE BY MANISH KALIA

Sets and Relations

JEE-MAINS (PREVIOUS YEAR)

MCQ-Single Correct

1. Let A and B be two sets containing four and two elements respectively. Then the number of subsets of the set $A \times B$, each having at least three elements is: (1) 256 (2) 275 (4) 219 (3) 510 [2015] If $X = \{4^n - 3n - 1 : n \in N\}$ and $Y = \{9(n-1) : n \in N\}$, where N is the set of natural numbers, 2. then $X \cup Y$ is equal to (1) N (2) Y - X 4) Y (3) X [2014] Let A and B be two sets containing 2 elements and 4 elements respectively. The number of 3. subsets of $A \times B$ having 3 or more elements is (1) 220 (2) 219 (3) 211 (4) 256 [2013] Let S be a non-empty subset of R. Consider the following statement: 4. P: There is a rational number $x \in S$ such that x > 0. Which of the following statements is the negation of the statement P? (1) There is no rational number $x \in S$ such that $x \leq 0$ (2) Every rational number $x \in S$ satisfies $x \leq 0$ (3) $x \in S$ and $x \leq 0 \Rightarrow x$ is not rational (4) There is a rational number $x \in S$ such that $x \leq 0$ [2010] 5. Consider the following relations: $R = \{(x,y) | x, y \text{ are real numbers and } x=wy \text{ for some rational number } w\};$



Mathematics for IIT-JEE by MANISH KALIA (B.Tech Delhi College Of Engineering) PH:9878146388,9464551253 | www.iitmathematics.com,www.alphaclasses.com SCO 43,TOP FLOOR,SECTOR 41-D,CHANDIGARH

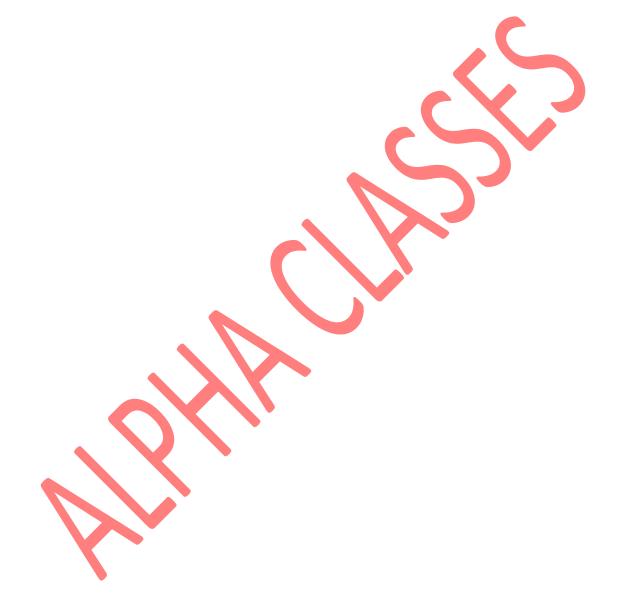
MATHEMATICS LECTURES FOR IIT-JEE BY MANISH KALIA

$$S = \left\{ \left(\frac{m}{n}, \frac{p}{q} \right) | m, n, p \text{ and } q \text{ are int } egers such n, q \neq 0 \text{ and } qm = pn \right\}.$$
 Then
(1) neither R nor S is an equivalence relation (2) S is an equivalence relation that B is not an equivalence relation (3) R and S both are equivalence relations
(4) R is an equivalence relation but S is not an equivalence relation
(5) If A, B nd C are three sets such that $A \cap B = A \cap C$ and $A \cup B = A \cup C$, then
(1) $A = B$ (2) $A = C$
(3) $B = C$ (4) $A \cap B = \phi$ [2009]
7. Let R be the real line. Consider the following subsets of the plane $R \times R$.
 $S = \{(x,y): y = x + 1 \text{ and } 0 < x < 2\}, T = \{(x,y): x - y \text{ is an Integer}\}.$ Which one of the following is true?
(1) neither S nor T is an equivalence relation on R
(2) Both S and T are equivalence relation on R
(3) S is an equivalence relation on R but T is not
(4) T is an equivalence relation on R but T is not
(4) T is an equivalence relation on R but T is not
(4) T is an equivalence relation on R but T is not
(5) S is an equivalence relation on R but T is not
(6) T is denote the words in the English dictionary. Define the relation R by: [2006]
R = {(x,y): $W \times W$ | the words x and y have at least one letter in common]. Then R is
(1) Not reflexive, symmetric and transitive (2) reflexive, not symmetric and transitive
(3) reflexive, symmetric and transitive (4) reflexive, not symmetric and transitive
(4) reflexive and symmetric only [2005]
10. Let R = {(1,3), (4,2), (2,4), (2,3), (3,1)} be a relation on the set A = {3,6,9,12} be a relation on the set A = {3,6,9,12}. The relation is
(1) reflexive and transitive only (2) reflexive and symmetric only [2005]
10. 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
(1) a function (2) reflexive
(3) not symmetric (4) transitive [2004]
Mathematics for IIT-JEE by MANISH KALIA (B.Tech Delhi College Of Eng



natics for IIT-JEE by MANISH KALIA (B.Tech Delhi College Of Engineering) PH:9878146388,9464551253|www.iitmathematics.com,www.alphaclasses.com <u>sco 43,top FLOOR,sector 41-D,CHANDIGARH</u>

MATHEMATICS LECTURES FOR IIT-JEE BY MANISH KALIA





Mathematics for IIT-JEE by MANISH KALIA (B.Tech Delhi College Of Engineering) PH:9878146388,9464551253 | www.iitmathematics.com,www.alphaclasses.com <u>SCO 43,TOP FLOOR,SECTOR 41-D,CHANDIGARH</u>