Term - 1

Chapter 1. Relations

Assignment 1

Multi Choice Questions. (Having Only one of the options correct)

1) Let N be the set of all natural numbers. If R be a relation in N, defined by

R = { (a, b) : a is a factor of b } then R is

(a) Equivalence Relation.

(b) Reflexive and symmetric but not transitive.

(c) Reflexive and transitive but not symmetric.

(d) Reflexive but not symmetric or transitive.

2) Let N be the set of all natural numbers. If R be a relation on N x N, defined by

(a, b) R (x, y) $\Leftrightarrow$ ay = bx , then R is

(a) Equivalence Relation.

(b) Reflexive and symmetric but not transitive.

(c) Reflexive and transitive but not symmetric.

(d) Reflexive but not symmetric or transitive.

3) Let A = { x $\in$ Z : 0 $\leq$ x $\leq$ 12 }. If R be the relation defined by

R = { (a, b) : a, b $\in$ A ; | a – b | is a multiple of 3 } then relation R is

(a) Equivalence Relation.

(b) Reflexive and symmetric but not transitive.

(c) Reflexive and transitive but not symmetric.

(d) Reflexive but not symmetric or transitive.

4) Let A = { 1, 2, 3, 4, 5, 6, 7, 8, 9 }. If R be a relation in A x A, defined by

(a, b) R (c, d) $\Leftrightarrow$ (a + d) = (b + c) $\forall$ (a, b) , (c, d) $\in$ A x A, then relation R is

(a) Reflexive and symmetric but not transitive.

(b) Reflexive and transitive but not symmetric.

(c) Reflexive but not symmetric or transitive.

(d) Equivalence Relation.

5) If R_1 and R_2 be two equivalent relations on a set A, then

(a) $R_1 \cap R_2$ and $R_1 \cup R_2$ both are equivalence relations on A.

(b) $R_1 \cup R_2$ is equivalence relation on A and $R_1 \cap R_2$ is not equivalence relation on A.

(c) $R_1 \cup R_2$ is not equivalence relation on A and $R_1 \cap R_2$ is equivalence relation on A.

(d) $R_1 \cap R_2$ and $R_1 \cup R_2$ both are not the equivalence relations on A.

6) Let A be set of all lines in xy-plane. If L_1 R L_2 $\Leftrightarrow$ Line L_1 is perpendicular to line L_2 for L_1 , L_2 $\in$ A, then set of lines related to line y = 2x + 3 on set A is,

(a) y + 2x = k, where k is real.

(b) 2y + x = k, where k is real.

(c) y - 2x = k, where k is real.

(d) 2y - x = k, where k is real.

7) Let S be the set of all real numbers. If R be a relation in S defined by R = { (a, b) : a $\leq$ b } is

(a) Equivalence Relation.

(b) Reflexive and symmetric but not transitive.

(c) Reflexive and transitive but not symmetric.

(d) Reflexive but not symmetric or transitive.

8) Let A = { 1, 2, 3, 4, 5, 6 }. If the relation R on A is defined as a R b $\Leftrightarrow$ b = a + 1, where a, b $\in$ A, then relation R is

(a) Equivalence relation.

(b) Reflexive, Symmetric but not transitive.

(c) Reflexive, but not Symmetric, not transitive.

(d) Not Reflexive, Not Symmetric, not transitive.

9) Let X be a nonempty set and let S be the collection of all subsets of X. If R be a relation in S, defined by R = { (A, B) : A $\subset$ B } then relation R is

(a) Equivalence relation.

(b) Reflexive, symmetric but not transitive.

(c) Transitive but not Reflexive not Symmetric.

(d) Not Reflexive, not symmetric, not transitive.

10) Let S be the set of all real numbers. If R be a relation in S defined by

R = { (a, b) : (1 + ab) $>$ 0 }

(a) Equivalence relation.

(b) Reflexive, Symmetric but not transitive.

(c) Reflexive, but not Symmetric, not transitive.

(d) Not Reflexive, Not Symmetric, not transitive.

Answer Key :-

1	2	3	4	5
c	a	a	d	**c**
6	**7**	**8**	**9**	**10**
b	c	d	c	b