DAYANANDA SAGAR COLLEGE OF ENGINEERING
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DEPARTMENT OF MATHEMATICS

COURSE : MATHEMATICAL STRUCTURES

COURSE CODE : 21MAT41A

MODULE – 4- RELATIONS

Multiple Choice Questions

Q.No.	Questions
1.	Which of the following is not an equivalence relation on the set of integers? (a) xRy iff x – y is an even integer (b) xRy iff x + y is even integer (c) xRy iff x = y (d) xRy iff x ≤ y
2	Let A = {a,b,c} and relation R= {(a,a),(b,b),(c,c),(b,c)} in a set A ,then R is (a) transitive relation (b) Symmetric relation (c) equivalence relation (d) None of these
3.	A relation R in a set A of all the books in a library of a college ,given by R = {(x,y): x and y have same number of pages} is (a)Reflexive (b) Symmetric (c) Transitive (d) All the above
4.	Let R_1 be a relation from A = {1, 3, 5, 7} to B = {2, 4, 6, 8} and R_2 be another relation from B to C = {1, 2, 3, 4} as defined below: i. An element a in A is related to an element b in B (under R_1) if a * b is divisible by 3. ii. An element a in B is related to an element b in C (under R_2) if a * b is even but not divisible by 3. Which is the composite relation R_1R_2 from A to C? (a) R_1R_2 = {(1, 2), (1, 4), (3, 3), (5, 4), (5,6), (7, 3)} (b) Φ (c) R_1R_2 = {(1, 2), (1,6), (3, 2), (3, 4), (5, 4), (7, 2)} (d) R_1R_2 = {(2,2), (3, 2), (3, 4), (5, 1), (5, 3), (7, 1)}
5.	How many relations exist from set X to set Y if the set X and set Y has 7 and 8 elements? (a) 2^{56} (b) 2^{72} (c) 3^{56} (d) 56
6.	Which statement is incorrect if X and Y are the two non-empty relations on the set S. (a)If X and Y are transitive, then the intersection of X and Y is also transitive. (b) If X and Y are reflexive, then the intersection of X and Y is also reflexive. (c) If X and Y are symmetric, then the union of X and Y is not symmetric. (d) If X and Y are transitive, then the union of X and Y is not transitive.
7.	Relations may exist between? (a) objects of the same set (b) between objects of two or more sets. (c)Both A and B (d) None of the above

8.	I f A = {a, b, c}, B = {0,1} and R = {(a,0), (b,0), (c,1)} is a relation from A to B then M_R = (a) $\begin{bmatrix}1 & 0\\1 & 0\\0 & 1\end{bmatrix}$ (b) $\begin{bmatrix}1 & 1 & 0\\0 & 0 & 1\end{bmatrix}$ (c) $\begin{bmatrix}1 & 0 & 0\\0 & 1 & 0\end{bmatrix}$ (d) $\begin{bmatrix}1 & 0 & 1\\0 & 0 & 1\end{bmatrix}$
9.	If $\|A\| = 6$ for a finite set A then the number of equivalence relations that can be defined on A is (a) 213 (b) 230 (c) 203 (d) None of these
10.	Let R be a relation defined on Z as (a, b) € R such that $a^2 + b^2 = 25$. Then domain of R is (a) {3,4,5} (b) {0,3,4,5} (c) {0, ±3, ±4, ±5} (d) None of these