

PARISHRAM 2025

Mathematics

DPP: 1

Relations and Functions

- Q1** Let A and B be finite sets containing 3 and 5 elements respectively then no. of relations that can be defined from A to B is
 (A) 2^{15} (B) 2^8
 (C) 2^{30} (D) 2^{18}
- Q2** If $n(A) = 3$ and a relation R is defined on set A , then no. of possible reflexive relations is
 (A) 64 (B) 32
 (C) 16 (D) 8
- Q3** Let $A = \{1, 2, 3\}$ & $B = \{5, 7, 9\}$ if a relation R is defined from A to B , defined as $R = \{(a, b) : a > b, a \in A \& b, \in B\}$ then R is
 (A) Universal Relation
 (B) Null Relation
 (C) Identity Relation
 (D) None of these
- Q4** Let $A = \{-5, -2, -3\}$ & $B = \{1, 5, 7\}$ if a relation R is defined from A to B defined by $R = \{(a, b) : a < b, a \in A \& b, \in B\}$ then R is
 (A) Universal Relation
 (B) Null Relation
 (C) Identity Relation
 (D) None of these
- Q5** In order that a relation R defined on a non-empty set A is an equivalence relation, it is sufficient, if R
 (A) Is reflexive
 (B) Is symmetric
 (C) Is transitive
 (D) Possesses all the above three properties
- Q6** Let A be the non-void set of the children in a family. The relation x is brother of y on A is
 (A) Reflexive (B) Symmetric
 (C) Transitive (D) None of these
- Q7** Let $A = \{1, 2, 3, 4\}$ and $R = \{(1, 2), (2, 3), (1, 3)\}$ be a relation on A , then R is
 (A) Transitive
 (B) Symmetric
 (C) Reflexive
 (D) Equivalence
- Q8** Let $B = \{a, b, c, d\}$ & $R = \{(a, c), (c, a), (a, a), (b, d), (d, b)\}$ be a relation on B , then R is
 (A) Symmetric
 (B) Transitive
 (C) Reflexive
 (D) Equivalence
- Q9** Let A be the set of all students in a school. A relation R is defined on A as follows: aRb iff a and b have the same teacher
 (A) Reflexive (B) Symmetric
 (C) Transitive (D) Equivalence
- Q10** 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) reflexive and symmetric only
 (D) equivalence relation
- Q11** Let R_1 be a relation defined by $R_1 = \{(a, b) \mid a \geq b, a, b \in R\}$. Then, R_1 is



- (A) An equivalence relation on R
- (B) Reflexive, transitive but not symmetric
- (C) Symmetric, transitive but not reflexive
- (D) Neither transitive nor reflexive but symmetric

Q12 The void relation on a set A is

- (A) Reflexive
- (B) Symmetric and transitive
- (C) Reflexive and symmetric
- (D) Reflexive and transitive

Q13 Show that the relation R in the set A of all the books in a library of a college, given by $R = \{(x, y) : x \text{ and } y \text{ have same number of pages}\}$ is an equivalence relation.

Q14 Let R be the relation in the set N given by $R = \{(a, b) : a - b \text{ is divisible by } 5\}$. Prove that R is an equivalence relation.

Q15 Show that the relation R defined in the set A of all triangles as $R = \{(T_1, T_2) : T_1 \text{ is similar to } T_2\}$, is equivalence relation. Consider three right angle triangles T_1 with sides 3, 4, 5, T_2 with sides 5, 12, 13 and T_3 with sides 6, 8, 10. Which triangles among T_1, T_2 and T_3 are related?



Answer Key

Q1 (A)
Q2 (A)
Q3 (B)
Q4 (A)
Q5 (D)
Q6 (C)
Q7 (A)
Q8 (A)

Q9 (D)
Q10 (A)
Q11 (B)
Q12 (B)
Q13 Check the solution
Q14 Check the solution
Q15 T_1 and T_3 are related.



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