RELATIONS AND FUNCTIONS

CARTESIAN PRODUCT, DOMAIN RANGE

EXERCISE

Q.1 If the Cartesian product of sets P and Q yields an empty set, which among the following is a null set?

(a) only P (b) only Q

(c) either P or Q (d) both P and Q

Q.2 If (a, b) = (x, y) then_____

(a) a=x (b) a=y

(c) a=y and b=x (d) a=x and b=y

Q.3 If set P contains 4 elements and set Q contains 5 elements, determine the total number of elements in the Cartesian product P × Q.

(a) 9 (b) 4^5 (c) 20 (d) 5^4

Q.4 Find values of x and y if (x+2, y-3) = (5,7).

(a) x=3 and y=10 (b) x=3 and y=4

(c) x=7 and y=4 (d) x=7 and y=10

Q.5 Does (a, b) equal (b, a)?

(a) True (b) False

Q.6 If the Cartesian product of set P × Q contains 10 elements which of the following is not possible?

(a) n(P)=1 and n(Q)=10 (b) n(P)=10 and n(Q)=1

(c) n(P)=2 and n(Q)=5 (d) n(P)=5 and n(Q)=4

Q.7 If P is equal to Q, is it true or false that P × Q equals Q × P?

(a) True (b) False

Q.8 If $A \times B = \{(1, a), (1, b), (1, c), (2, a), (2, b), (2, c)\}$ then determine the set A.

(a) {1} (b) {1, 2} (c) {1, a} (d) {a, b, c}

Q.9 If $A \times B = \{(1, a), (1, b), (1, c), (2, a), (2, b), (2, c)\}$ then identify set B.

(a) {1} (b) {1, 2} (c) {1, a} (d) {a, b, c}

Q.10 If set A has 2 elements and set B has 3 elements, determine the number of subsets in the Cartesian product $A \times B$.

(a) 6 (b) 8 (c) 32 (d) 64

ANSWER KEY

1. (c)

2. (d)

3. (c)

4. (a)

5. (b)

6. (d)

7. (a)

8. (b)

9. (d)

10. (d)