

NAME :

CLASS & SEC. :

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## RELATIONS AND FUNCTIONS

"Mathematicians do not study objects, but relations between objects... Content to them is irrelevant: they are interested in form only" - Henri Poincare



### Multiple choice questions

- If  $n(A \times B) = 6$  and  $A = \{1, 3\}$  then  $n(B)$  is  
(A) 1 (B) 2 (C) 3 (D) 6
- $A = \{a, b, p\}$ ,  $B = \{2, 3\}$ ,  $C = \{p, q, r, s\}$  then  $n[(A \cup C) \times B]$  is  
(A) 8 (B) 20 (C) 12 (D) 16
- If  $A = \{1, 2\}$ ,  $B = \{1, 2, 3, 4\}$ ,  $C = \{5, 6\}$  and  $D = \{5, 6, 7, 8\}$  then state which of the following statement is true.  
(A)  $(A \times C) \subset (B \times D)$  (B)  $(B \times D) \subset (A \times C)$   
(C)  $(A \times B) \subset (A \times D)$  (D)  $(D \times A) \subset (B \times A)$
- If there are 1024 relations from a set  $A = \{1, 2, 3, 4, 5\}$  to a set  $B$ , then the number of elements in  $B$  is  
(A) 3 (B) 2 (C) 4 (D) 8
- The range of the relation  $R = \{(x, x^2) \mid x \text{ is a prime number less than } 13\}$  is  
(A)  $\{2, 3, 5, 7\}$  (B)  $\{2, 3, 5, 7, 11\}$   
(C)  $\{4, 9, 25, 49, 121\}$  (D)  $\{1, 4, 9, 25, 49, 121\}$
- If the ordered pairs  $(a + 2, 4)$  and  $(5, 2a + b)$  are equal then  $(a, b)$  is  
(A)  $(2, -2)$  (B)  $(5, 1)$  (C)  $(2, 3)$  (D)  $(3, -2)$
- Let  $n(A) = m$  and  $n(B) = n$  then the total number of non-empty relations that can be defined from  $A$  to  $B$  is  
(A)  $m^n$  (B)  $n^m$  (C)  $2^{mn} - 1$  (D)  $2^{mn}$
- If  $\{(a, 8), (6, b)\}$  represents an identity function, then the value of  $a$  and  $b$  are respectively  
(A)  $(8, 6)$  (B)  $(8, 8)$  (C)  $(6, 8)$  (D)  $(6, 6)$
- Let  $A = \{1, 2, 3, 4\}$  and  $B = \{4, 8, 9, 10\}$ . A function  $f : A \rightarrow B$  given by  $f = \{(1, 4), (2, 8), (3, 9), (4, 10)\}$  is a  
(A) Many-one function (B) Identity function  
(C) One-to-one function (D) Into function
- If  $f(x) = 2x^2$  and  $g(x) = \frac{1}{3x}$ , then  $f \circ g$  is  
(A)  $\frac{3}{2x^2}$  (B)  $\frac{2}{3x^2}$  (C)  $\frac{2}{9x^2}$  (D)  $\frac{1}{6x^2}$
- If  $f : A \rightarrow B$  is a bijective function and if  $n(B) = 7$ , then  $n(A)$  is equal to  
(A) 7 (B) 49 (C) 1 (D) 14
- Let  $f$  and  $g$  be two functions given by  
 $f = \{(0, 1), (2, 0), (3, -4), (4, 2), (5, 7)\}$   
 $g = \{(0, 2), (1, 0), (2, 4), (-4, 2), (7, 0)\}$  then the range of  $f \circ g$  is  
(A)  $\{0, 2, 3, 4, 5\}$  (B)  $\{-4, 1, 0, 2, 7\}$  (C)  $\{1, 2, 3, 4, 5\}$  (D)  $\{0, 1, 2\}$
- Let  $f(x) = \sqrt{1 + x^2}$  then  
(A)  $f(xy) = f(x) \cdot f(y)$  (B)  $f(xy) \geq f(x) \cdot f(y)$   
(C)  $f(xy) \leq f(x) \cdot f(y)$  (D) None of these
- If  $g = \{(1, 1), (2, 3), (3, 5), (4, 7)\}$  is a function given by  $g(x) = \alpha x + \beta$  then the values of  $\alpha$  and  $\beta$  are  
(A)  $(-1, 2)$  (B)  $(2, -1)$  (C)  $(-1, -2)$  (D)  $(1, 2)$
- $f(x) = (x + 1)^3 - (x - 1)^3$  represents a function which is  
(A) linear (B) cubic (C) reciprocal (D) quadratic

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