

SET THEORY

3. Let A and B be sets in a finite universal set U. Given the following:

$|A - B|$, $|A \cap B|$, $|A| + |B|$ and $|A \cup B|$

Which of the following is in order of increasing size ?

- (A) $|A - B| \leq |A \cap B| \leq |A| + |B| \leq |A \cup B|$
(B) $|A \cap B| \leq |A - B| \leq |A \cup B| \leq |A| + |B|$
(C) $|A \cap B| \leq |A| + |B| \leq |A - B| \leq |A \cup B|$
(D) $|A - B| \leq |A \cap B| \leq |A \cup B| \leq |A| + |B|$

Answer: D

UGC-NET | UGC NET CS 2016 Aug – II | Question 3

1. How many different equivalence relations with exactly three different equivalence classes are there on a set with five elements?

- (A) 10 (B) 15
(C) 25 (D) 30

Answer: C

July 2016 Solved Paper 2 No 1

3. Which of the following is/are not true?

- (a) The set of negative integers is countable.
(b) The set of integers that are multiples of 7 is countable.
(c) The set of even integers is countable.
(d) The set of real numbers between 0 and $\frac{1}{2}$ is countable.

- (A) (a) and (c) (B) (b) and (d)
(C) (b) only (D) (d) only

Answer: D

UGCNET-Dec2015-II-3

1. Consider a set $A = \{1, 2, 3, \dots, 1000\}$. How many members of A shall be divisible by 3 or by 5 or by both 3 and 5 ?

- (A) 533 (B) 599
(C) 467 (D) 66

Answer: C

UGCNET-Dec2014-II-01

37. Let f and g be the functions from the set of integers to the set integers defined by

$f(x) = 2x + 3$ and $g(x) = 3x + 2$

Then the composition of f and g and g and f is given as

- (A) $6x + 7, 6x + 11$
(B) $6x + 11, 6x + 7$

- (C) $5x + 5, 5x + 5$
(D) None of the above

Answer: A

UGCNET-Dec2013-II-37 - GATE Overflow

4. Consider the relation on the set of non-negative integers defined by $x \equiv y$ if and only if:
(A) $x \bmod 3 = 3 \bmod y$ (B) $3 \bmod x = 3 \bmod y$
(C) $x \bmod 3 = y \bmod 3$ (D) None of the above

Answer C

C.S. PAPER II JUNE 2005 No 4

5. If I_m denotes the set of integers modulo m , then the following are fields with respect to the operations of addition modulo m and multiplication modulo m :

- (i) Z_{23} (ii) Z_{29}
(iii) Z_{31} (iv) Z_{33}

Then

- (A) (i) only
(B) (i) and (ii) only
(C) (i), (ii) and (iii) only
(D) (i), (ii), (iii) and (iv)

Answer: C

UGC NET Computer Science December Paper II No 5

4. The set of positive integers under the operation of ordinary multiplication is:
(A) not a monoid
(B) not a group
(C) a group
(D) an Abelian group

Answer: D

UGCNET-june2008-ii-4

3. Let A and B be sets in a finite universal set U . Given the following:

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Which of the following is in order of increasing size ?

- (A) $|A - B| \leq |A \cap B| \leq |A| + |B| \leq |A \cup B|$
(B) $|A \cap B| \leq |A - B| \leq |A \cup B| \leq |A| + |B|$
(C) $|A \cup B| \leq |A| + |B| \leq |A - B| \leq |A \cap B|$
(D) $|A - B| \leq |A \cap B| \leq |A \cup B| \leq |A| + |B|$

Answer: D

UGCNET-AUG2016-II-3

3. Suppose that R_1 and R_2 are reflexive relations on a set A .

Which of the following statements is correct?

- (A) $R_1 \cap R_2$ is reflexive and $R_1 \cup R_2$ is irreflexive.
(B) $R_1 \cap R_2$ is irreflexive and $R_1 \cup R_2$ is reflexive.
(C) Both $R_1 \cap R_2$ and $R_1 \cup R_2$ are reflexive.

(D) Both $R_1 \cap R_2$ and $R_1 \cup R_2$ are irreflexive.

Answer: C

UGCNET-June2016-II-3

4. The power set of the set $\{\phi\}$ is
- (A) $\{\phi\}$ (B) $\{\phi, \{\phi\}\}$
(C) $\{0\}$ (D) $\{0, \phi, \{\phi\}\}$

Answer: B

UGC NET DEC 2012 PAPER II Q-4

5. If I_m denotes the set of integers modulo m , then the following are fields with respect to the operations of addition modulo m and multiplication modulo m :
- (i) Z_{23} (ii) Z_{29}
(iii) Z_{31} (iv) Z_{33}

Then

- (A) (i) only
(B) (i) and (ii) only
(C) (i), (ii) and (iii) only
(D) (i), (ii), (iii) and (iv)

Answer: C

3. Let A and B be two arbitrary events, then:

- (A) $P(A \cap B) = P(A)P(B)$
(B) $P(A \cup B) = P(A) + P(B)$
(C) $P(A \cup B) \leq P(A) + P(B)$
(D) $P(A/B) = P(A \cap B) + P(B)$

Answer: C

GATE1994-1.4, ISRO2017-2

4. Consider the relation on the set of non-negative integers defined by $x \equiv y$ if and only if:

- (A) $x \bmod 3 = 3 \bmod y$ (B) $3 \bmod x = 3 \bmod y$
(C) $x \bmod 3 = y \bmod 3$ (D) None of the above

Answer: C

UGC NET Computer Science Paper-2 June 2005 No 4

5. In a set of 8 positive integers, there always exists a pair of numbers having the same remainder when divided by:

- (A) 7
(B) 11
(C) 13
(D) 15

Answer: A

ugcnet_june_2008_II

26. Let A be the set of comfortable houses given as

$$A = \left\{ \frac{x_1}{0.8}, \frac{x_2}{0.9}, \frac{x_3}{0.1}, \frac{x_4}{0.7} \right\}$$

and B be the set of affordable houses

$$B = \left\{ \frac{x_1}{0.9}, \frac{x_2}{0.8}, \frac{x_3}{0.6}, \frac{x_4}{0.2} \right\}$$

Then the set of comfortable and affordable houses is

(A) $\left\{ \frac{x_1}{0.8}, \frac{x_2}{0.8}, \frac{x_3}{0.1}, \frac{x_4}{0.2} \right\}$

(B) $\left\{ \frac{x_1}{0.9}, \frac{x_2}{0.9}, \frac{x_3}{0.6}, \frac{x_4}{0.7} \right\}$

(C) $\left\{ \frac{x_1}{0.8}, \frac{x_2}{0.8}, \frac{x_3}{0.6}, \frac{x_4}{0.7} \right\}$

(D) $\left\{ \frac{x_1}{0.7}, \frac{x_2}{0.7}, \frac{x_3}{0.7}, \frac{x_4}{0.9} \right\}$

Answer: A

UGCNET-Sep2013-III-26

34. The power set of $A \cup B$, where $A = \{2, 3, 5, 7\}$ and $B = \{2, 5, 8, 9\}$ is

(A) 256

(B) 64

(C) 16

(D) 4

Answer: B

UGCNET-Dec2012-III-34

50. How many relations are there on a set with n elements that are symmetric and a set with n elements that are reflexive and symmetric?

(A) $2^{n(n+1)/2}$ and $2^n \cdot 3^{n(n-1)/2}$

(B) $3^{n(n-1)/2}$ and $2^{n(n-1)}$

(C) $2^{n(n+1)/2}$ and $3^{n(n-1)/2}$

(D) $2^{n(n+1)/2}$ and $2^{n(n-1)/2}$

Answer: D

67. Let $a * H$ and $b * H$ be two cosets of H .

(i) Either $a * H$ and $b * H$ are disjoint

(ii) $a * H$ and $b * H$ are identical

Then,

(A) only (i) is true

(B) only (ii) is true

(C) (i) or (ii) is true

(D) (i) and (ii) is false

Answer: C

UGCNET-June2012-III-67

7. Given $U = \{1, 2, 3, 4, 5, 6, 7\}$
 $A = \{(3, 0.7), (5, 1), (6, 0.8)\}$
then A^{\sim} will be : (where \sim \square \square complement)
- (A) $\{(4, 0.7), (2, 1), (1, 0.8)\}$
(B) $\{(4, 0.3), (5, 0), (6, 0.2)\}$
(C) $\{(1, 1), (2, 1), (3, 0.3), (4, 1), (6, 0.2), (7, 1)\}$
(D) $\{(3, 0.3), (6, 0.2)\}$

Answer: C

UGCNET-June2014-III-07

3. Suppose that R_1 and R_2 are reflexive relations on a set A .
Which of the following statements is correct?
- (A) $R_1 \cap R_2$ is reflexive and $R_1 \cup R_2$ is irreflexive.
(B) $R_1 \cap R_2$ is irreflexive and $R_1 \cup R_2$ is reflexive.
(C) Both $R_1 \cap R_2$ and $R_1 \cup R_2$ are reflexive.
(D) Both $R_1 \cap R_2$ and $R_1 \cup R_2$ are irreflexive.

Answer: C

UGCNET-June2016-II-3

3. A partially ordered set is said to be a lattice if every two elements in the set have
- (A) a unique least upper bound
(B) a unique greatest lower bound
(C) both (A) and (B)
(D) none of the above

Answer: C

UGC NET DEC 2010 PAPER II Q-3

4. P: "Program is a step by step execution of the instructions". Given P, which of the following is true?
- (A) Program is a subset of an instruction set.
(B) Program is a sequence of a subset of an instruction set.
(C) Program is a partially ordered set of an instruction set.
(D) All of the above

Answer: B

UGCNET-dec2009-ii-04