

**Q 22**

Among a group of 100 people there are atleast how many people who share the same birth month?

- A 10
- B 9
- C 8
- D 7

**Ops:** A.

B.  B

C.

D.

[reset answer](#)



**Q 23**

Which rule of inference is used in the following argument?"If it snows today , the ground will be covered in snow . Then if it is not snowing . Then from which we can conclude that the ground is not covered in snow ."

Q 25

How many w

women stand

A  $8!P(9, 5)$

B  $8!C(9, 5)$

C  $8P(9, 5)$

D  $9P(8, 5)$

Ops: A.  A

B.  B

C.  C

D.  D

reset answer



If R is a relation

A

B

Q 23

If  $R$  is a relation on the set of real numbers such that  $(x, y) \in R$  iff  $x = 2y$ , then  $R$  is

- A reflexive
- B symmetric
- C antisymmetric
- D transitive



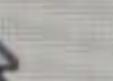
Ops: A.

B.

C.

D.

**Q 18**

If a function assigns to a bit string the number of one bits  in the string  
the function is

- A the set of integers
- B the set of positive integers
- C the set of negative integers
- D the set of nonnegative integers

Q22

- A. 35 cents  
B. 36 cents  
C. 34 cents  
D. 33 cents

- Ops: A.  A  
B.  B  
C.  C  
 D

Answer

**Q 20**

If the matrix  $M_R = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \end{bmatrix}$  represents a relation  $R$  then the matrix representing  $R^2$  is given by

A  $M_{R^2} = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$

B  $M_{R^2} = \begin{bmatrix} 0 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

C  $M_{R^2} = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

D  $M_{R^2} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

**Ops:** A.  A

B.  B

C

D

What is the value of  $\sum_{i=1}^3 \sum_{j=0}^2$

- A  18  
B  15  
C  12  
D  9

A.  A

B.  B

C.  C

D.  D

Which of the following is NOT a tautology?

A.  $(p \wedge (p \rightarrow q)) \rightarrow q$

B.  $(\neg p \vee (p \rightarrow q)) \rightarrow \neg q$

C.  $(p \wedge (\neg p \rightarrow q)) \rightarrow q$

Q 6

Which is the inverse of the conditional statement “ I come to class whenever there is going to be a quiz.”

- A If I come to class, then there will be no quiz.
- B If there is no quiz, then I come to class.
- C If I do not come to class, then there will not be a quiz.
- D If there is not going to be a quiz, then I do not come to class.”

Ops: A. B. C. D. [reset answer](#)

Q 7

How many ways are there to select 11 unordered elements from a set with 3 elements when repetition is allowed?

A 11

B 3

C 33

D 78

Ops: A. B. C. D. [reset answer](#)

**Q 1**

The recursive definition for the sequence  $\{a_n\}, n=1,2,3,\dots$  if  $a_1 = 10^4$  is

- A.  $a_{n+1} = 6a_n \quad \forall n \geq 1$
- B.  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$
- C.  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$
- D.  $a_{n+1} = a_n \quad \forall n \geq 1$

~~⊗~~

**Ops:** A.  A

B.  B

C.  C

D.  D

Which of the following is not a tautology?

**Q 2**

A  $(p \wedge (p \rightarrow q)) \rightarrow q$

B  $(\neg q \wedge (p \rightarrow q)) \rightarrow \neg p$

D. D

reset answer

Q 14

The recursive definition for the sequence  $\{a_n\}, n=1, 2, 3, \dots$  if  $a_1 = 10^8$  is

- A.  $a_{n+1} = 6a_n \quad \forall n \geq 1$
- B.  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$
- C.  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$
- D.  $a_{n+1} = a_n \quad \forall n \geq 1$

Ops: A.  A

X Ø

B.  B

C.  C

D.  D

Q 15

Which of the following two compound propositions are logically equivalent?

- A.  $\neg(p \rightarrow q)$  and  $p \rightarrow \neg q$
- B.  $(p \rightarrow q)$  and  $p \rightarrow \neg q$
- C.  $\neg(p \rightarrow q)$  and  $\neg p \rightarrow \neg q$
- D.  $\neg(p \rightarrow q)$  and  $\neg q \rightarrow p$

Ops: A.  A



Q 11 How many ways are there to select 11 unordered elements from a set with when repetition is allowed?

- A 11
- B 3
- C 33
- D 78

- Ans: A.  A  
B.  B  
C.  C  
D.  D

- C.  C
  - D.  D
- 

**Q 26** Which of the following is the linear combination representing  $\gcd(21, 55)$ ?

- A.  $21(21) + 55(-7)$
- B.  $21(21) + 55(-8)$
- C.  $21(20) + 55(9)$
- D.  $21(22) + 55(-10)$

**Ops:** A.  A

B.  B

C.  C

D.  D

[reset answer](#)

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**Q 27** Which is the inverse of the conditional statement “ I come to class whenever there is going to be a quiz.”

- A. If I come to class, then there will be no quiz.

a function assigns to a bit string the number of one bits in the string then the range of the function is

set of integers

set of positive integers

set of negative integers

set of nonnegative integers

Q1

If the matrix  $M_R = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \end{bmatrix}$  represents a relation  $R$  then the matrix representing  $R^2$  is given by

A  $M_{R^2} = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$

B  $M_{R^2} = \begin{bmatrix} 0 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

C  $M_{R^2} = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

D  $M_{R^2} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

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DELL

D.  D

reset answer

Q 2

If  $f(0) = 1$ ,  $f(n) = -f(n-1)$  for  $n \geq 1$  is a valid recursive definition of a function  $f$  then the formula for  $f(n)$  is given by

- A  $f(n) = (-1)^n$
- B  $f(n) = (-1)^{n+1}$
- C  $f(n) = (-2)^n$
- D  $f(n) = -1$

Ops: A.  A  
B.  B  
C.  C  
D.  D



Q 3 Atleast, which amount of postage can be formed using just 4 cent and 11 cent stamps?

**i** 1 Questions

Important Instructions & Guidelines

Q1

Which of the following is not a Carmichael number?

- A 561
- B 1729
- C 2820
- D 2821

Ops: A  B  C  D

reset answer

Q2

How many positive integers less than 1000 are divisible by 72?

- A 1540
- B 1541
- C 1542
- D 1543

Ops: A 875 B 876 C 877 D 878

Which elements of the poset  $(\{2, 4, 5, 10, 12, 20, 25, 1\})$  are m

- B. 25
- C. 20 and 25
- D. 12 and 25
- D. 12, 20 and 25

Ops:

- A.
- B.
- C.
- D.



The recursive definition for the Fibonacci numbers are

- A  $f_n = f_{n-1} + f_{n-2}$   
 B  $f_n = f_{n-1} - f_{n-2}$   
 C  $f_n = 2f_{n-1} + f_{n-2}$   
 D  $f_n = f_{n-1} \times 2f_{n-2}$

- Ops:  
 A.  A  
 B.  B  
 C.  C  
 D.  D

Q15

- The recursive definition for the sequence  $a_n$  is
- A  $a_{n+1} = 6a_n \forall n \geq 1$   
 B  $a_{n+1} = a_n + 6 \forall n \geq 1$   
 C  $a_{n+1} = a_n \times 6 \forall n \geq 1$   
 D  $a_{n+1} = 6a_n + 1 \forall n \geq 1$

Q 14 What is the coefficient of  $x^3y^8$  in the expansion of  $(x+y)^{13}$ ?

- A 1200  
B 1250  
C 1287  
D 1288

Ops: A.  A  
B.  B  
C.  C  
D.  D

Q 15

If  $f(0)=1$ ,  $f(n) = -f(n-1)$  for  $n \geq 1$  is a valid recursive definition of a function  $f(n)$ .  
the formula for  $f(n)$  is given by

- A  $f(n) = (-1)^n$   
B  $f(n) = (-1)^{n+1}$   
C  $f(n) = (-2)^n$   
D  $f(n) = -1$

**Q 16**

What is the coefficient of  $x^5y^8$  in the expansion of  $(x+y)^{19}$ ?

- A. 1200
- B. 1250
- C. 1287
- D. 1288

Ops: A.  A

B.  B

C.  C

D.  D

reset answer

D.  D

[reset answer](#)

Q 2

If the domain is taken as all people for the logical expression for the statement

- A  $\forall x P(x)$
- B  $\exists x P(x)$
- C  $\forall x \neg P(x)$
- D  $\exists x \neg P(x)$

Ops: A.  A  
B.  B  
C.  C  
D.  D

Q 3

Which of the following set represents the congruence modulo 4?

- A  $\{..., -8, -4, 0, 4, 8, ...\}$
- B  $\{..., -7, -3, 1, 5, 9, ...\}$
- C  $\{..., -6, -2, 2, 6, 10, ...\}$
- D  $\{..., -5, -1, 3, 7, 11, ...\}$

Ops: A.  A  
B.  B  
C.  C  
D.  D

Q 4

If  $f : \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$  is a function, where  $\mathbb{Z}$  is

D.  D

reset answer



Q 2

Which of the following is not a tautology?

- A  $(p \wedge (p \rightarrow q)) \rightarrow q$
- B  $(\neg q \wedge (p \rightarrow q)) \rightarrow \neg p$
- C  $(\neg p \wedge (p \rightarrow q)) \rightarrow \neg q$
- D  $((p \vee q) \wedge \neg p) \rightarrow q$

Ops: A.  A

B.  B

C.  C

D.  D

Q 3

The recursive definition

D.  $\bigcirc D$

Q5

If  $f : Z \times Z \rightarrow Z$  is a function, where  $Z$  is the set of integers, then which of the following functions is not a onto function?

- A  $f(m, n) = m + n$
- B  $f(m, n) = m^2 - 4$
- C  $f(m, n) = 2m - n$
- D  $f(m, n) = m + n + 1$

Ops: A.  $\bigcirc A$

B.  B

C.  $\bigcirc C$

Q 6 Which of the following is not a tautology?

- A  $(p \wedge (p \rightarrow q)) \rightarrow q$
- B  $(\neg q \wedge (p \rightarrow q)) \rightarrow \neg p$
- C  $(\neg p \wedge (p \rightarrow q)) \rightarrow \neg q$
- D  $((p \vee q) \wedge \neg p) \rightarrow q$

Ops: A.  A

B.  B

C.  C

D.  D

Q 7 How many ways are there to select 11 unordered elements from a set with 3 elements when repetition is allowed?

- A 11
- B 3
- C 33
- D 78

Ops: A.  A

B.  B

C.  C

D.  D

Q 8

$3^n < n!$ , where  $n$  is an integer for

DELL

**Q 16**

How many ways are there for 8 women stand next to each other in a row?

- A  $8!P(9,5)$
- B  $8!C(9,5)$
- C  $8P(9,5)$
- D  $9P(8,5)$

**Ops:** A.  A

B.  B

C.  C

D.  D

**Q 17**

Which rule of inference is used in the argument “If the university will close, Then we will not have classes today.”

- A Modus Ponens
- B Modus Tollens
- C Hypothetical Syllogism
- D Simplification

Q 17

If the matrix  $M_R = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \end{bmatrix}$  represents a relation  $R$  then the matrix representing  $R^2$  is given by

A  $M_{R^2} = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$

B  $M_{R^2} = \begin{bmatrix} 0 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

C  $M_{R^2} = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

D  $M_{R^2} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

**Q 16**

How many positive integers between 1000 and 9999 inclusive are divisible by 5 but not by 7?

- A 1540
- B 1541
- C 1542
- D 1543

**Ops:** A.  A

B.  B

C.  C

D.  D

**Q 17**

Which elements of the poset  $(\{2, 4, 5, 10, 12, 20, 25\}, |)$  are maximal?

- A 25

university will close. The university today."

- A Modus Ponens
- B Modus Tollens
- C Hypothetical Syllogism
- D Simplification

**Ops:** A.  A

B.  B

C.  C

D.  D

[reset answer](#)

Q 6

Which rule of inference is used in the following argument?"If it snows today , the university will close. The university is not closed today. Therefore, it did not snow today."

- A Modus Ponens
- B Modus Tollens
- C Hypothetical Syllogism
- D Simplification

Ops: A.  A

B.  B

C.  C

D.  D

- Ops:* A.  A  
B.  B  
C.  C  
D.  D

Q 12

What is the hexadecimal representation of the binary expansion  $(100000001110)_{10}$ ?

- A.   $(80E)_{16}$   
B.   $(8E)_{16}$   
C.   $(10D)_{16}$   
D.   $(E08)_{16}$

- Ops:* A.  A  
B.  B  
C.  C  
D.  D

What is the coefficient of  $y^5 v^8$  in the expansion of  $(x + y)^{13}$ ?

How many comparisons are performed in sorting the sequence 6,2,3,1,4,5 in increasing order by the bubble sort algorithm?

12

13

14

15

A

B

C

D

How many nonzero entries does the matrix representing the relation  $R$  on

**Q 19**

Which is not the inverse of 2 modulo 17?

- A 9
- B -8
- C 10
- D 26

Ops: A.  A

B.  B

C.  C

D.  D

[reset answer](#)



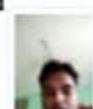
Welcome Sritam Maharana



23 : 05

min

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**Q 3**Which of the following is the linear combination representing  $\gcd(21, 55)$ ?

- A  $21(21) + 55(-7)$
- B  $21(21) + 55(-8)$
- C  $21(20) + 55(9)$
- D  $21(22) + 55(-10)$

Ops: A.  AB.  BC.  CD.  D[reset answer](#)**Q 4** $3^n < n!$ , where  $n$  is an integer for

- A  $n > 3$
- B  $n > 4$
- C  $n > 5$
- D  $n > 6$

Ops: A.  AB.  BC.  CD.  D[reset answer](#)

C.  C

D.  D

[reset answer](#)

Q 3

If  $R$  is a relation on the set of real numbers such that  $(x, y) \in R$  iff  $x = 2y$ , then  $R$  is

- A reflexive
- B symmetric
- C antisymmetric
- D transitive

Ops: A.  A

B.  B

C.  C

D.  D

Q 4

If  $f(0) = 1, f(n) = -f(n-1)$  for  $n \geq 1$  is a valid recursive definition of a function  $f$  then

- C.  C
- D.  D

[reset answer](#)

Q 20

Which of the following set represents the equivalence class of 14 with respect to the congruence modulo 4?

- A.  $\{..., -8, -4, 0, 4, 8, ...\}$
- B.  $\{..., -7, -3, 1, 5, 9, ...\}$
- C.  $\{..., -6, -2, 2, 6, 10, ...\}$
- D.  $\{..., -5, -1, 3, 7, 11, ...\}$

- Ops:
- A.  A
  - B.  B
  - C.  C
  - D.  D

Q 21

What is the hexadecimal representation of the binary expansion  $(100000001110)_2$ ?

**Q 14**

At least, which amount of postage can be formed using just 4 cent and 11 cent stamps?

- A. 35 cents
- B. 36 cents
- C. 34 cents
- D. 33 cents

Ops: A.

B.

C.

D.

reset answer

Q 25

Which of the following set represents the equivalence class of 14 with respect to the congruence modulo 4?

- A  $\{..., -8, -4, 0, 4, 8, \dots\}$
- B  $\{..., -7, -3, 1, 5, 9, \dots\}$
- C  $\{..., -6, -2, 2, 6, 10, \dots\}$
- D  $\{..., -5, -1, 3, 7, 11, \dots\}$

Ops: A.

B.

C.

D.

- Ops: A.  A  
B.  B  
C.  C  
D.  D

reset answer

28 How many comparisons are performed in sorting the sequence 6,2,3,1,4,5 in increasing order by the bubble sort algorithm?

- A. 12  
B. 13  
C. 14  
D. 15

- A.  A  
B.  B  
C.  C  
D.  D

If a function assigns to a bit string the number of one bits in the string then the range of the function is

- A. the set of integers  
B. the set of positive integers  
C. the set of negative integers  
D. the set of real numbers

DELL

D.  D

**Q 13**

How many nonzero entries does the matrix representing the relation  $R$  on  
 $A = \{1, 2, 3, \dots, 100\}$  consisting of the first 100 positive integers have if  $R = \{(a, b) | a \neq b\}$ .

- A. 100
- B. 99
- C. 9900
- D. 4950

Ops: A.  A

B.  B

C.  C

D.  D

reset answer

reset answer

Q 24

The recursive definition for the

- A  $a_{n+1} = 6a_n \quad \forall n \geq 1$
- B  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$
- C  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$
- D  $a_{n+1} = a_n \quad \forall n \geq 1$

Ops: A.  A

- B.  B
- C.  C
- D.  D
- 

Q 25

What is the value of  $\sum_{i=1}^3 \sum_{j=0}^2 i$ ?

- A 18
- B 15
- C 12
- D 9
- 

- Ops: A.  A  
B.  B  
C.  C  
D.  D

- Q17 Which is the inverse of the conditional statement "I come to class whenever going to be a quiz."  
A If I come to class, then there will be no quiz.  
B If there is no quiz, then I come to class.  
C If I do not come to class, then there will not be a quiz.  
D If there is not going to be a quiz, then I do not come to class.

- Ops: A.  A  
B.  B  
C.  C  
D.  D

- B.  B  
C.  C  
D.  D

reset answer

Q 8

Which elements of the poset  $(\{2, 4, 5, 10, 12, 20, 25\}, |)$  are maximal?

- A 25  
B 20 and 25  
C 12 and 25  
D 12, 20 and 25

Ops: A.  A

B.  B

C.  C

D.  D

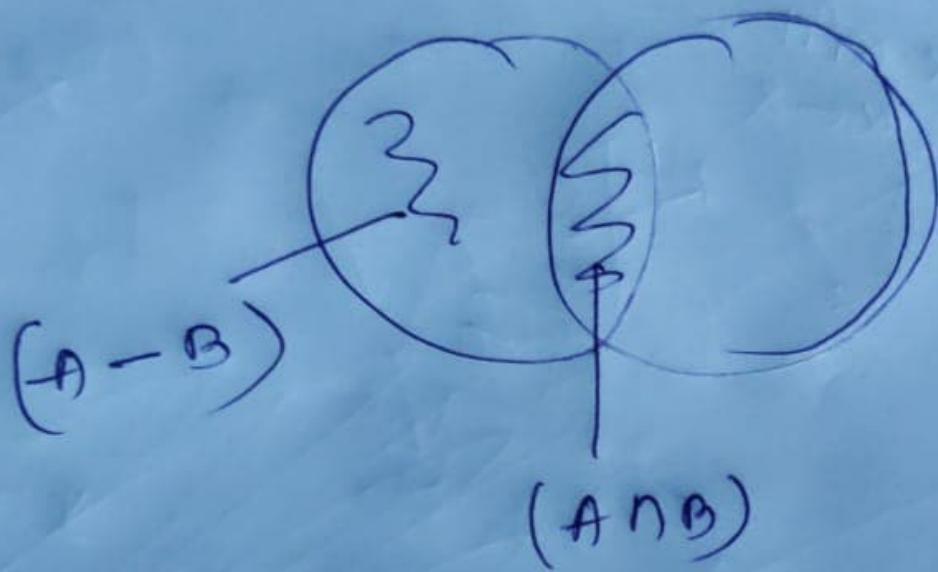
Q 9

If  $A$  and  $B$  are two sets then

- A  $(A \cap B) \subseteq A$   
B  $(A \cup B) \subseteq A$   
C  $(A \cap B) \subseteq (A - B)$   
D  $(A \cup B) \subseteq (A - B)$



A      B



$$(A \cap B) \subseteq A$$

- 03  
a.  $O^B$   
b.  $O^C$   
c.  $O^D$

The recursive definition for the sequence  $\{a_n\}, n=1, 2, 3, \dots$  if  $a_1 = 10^n$  is

- A  $a_{n+1} = 6a_n \quad \forall n \geq 1$   
B  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$   
C  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$   
D  $a_{n+1} = a_n \quad \forall n \geq 1$

Ops: A  B  C  D



C  D

04

What is the hexadecimal representation of the binary expansion  $(100000001110)_2$ ?

- A  $(80E)_{16}$   
B  $(80F)_{16}$

**Q 17**

- Which is the inverse of the conditional statement "I come to class whenever there is going to be a quiz":
- A. If I come to class, then there will be no quiz.
  - B. If there is no quiz, then I come to class.
  - C. If I do not come to class, then there will not be a quiz.
  - D. If there is not going to be a quiz, then I do not come to class.

Ops: A,



B.



C.



D.

reset answer

**Q 29**

How many ways are there to select 11 unordered elements from a set with 3 elements when repetition is allowed?

- A 11
- B 3
- C 33
- D 78

**Ops:** A.  A

B.  B

C.  C

D.  D

**Q 21**

How many nonzero entries does the matrix representing the relation  $R$  on  $A = \{1, 2, 3, \dots, 100\}$  consisting of the first 100 positive integers have if  $R = \{(a, b) \mid a \neq b\}$ .

- A 100
- B 99
- C 9900
- D 4950

Ops: A.  A  
B.  B  
C.  C  
D.  D



Welcome Sritam Maharana



27 : 53

min

sec

**Q 1**

Which is the inverse of the conditional statement “ I come to class whenever there is going to be a quiz.”

- A. If I come to class, then there will be no quiz.
- B. If there is no quiz, then I come to class.
- C. If I do not come to class, then there will not be a quiz.
- D. If there is not going to be a quiz, then I do not come to class.”

**Ops:** A.  AB.  BC.  CD.  D[reset answer](#)**Q 2**

The recursive definition for the Fibonacci numbers are

- A.  $f_n = f_{n-1} + f_{n-2}$
- B.  $f_n = f_{n-1} - f_{n-2}$
- C.  $f_n = 2f_{n-1} + f_{n-2}$
- D.  $f_n = f_{n-1} + 2f_{n-2}$

**Ops:** A.  AB.  BC.  CD.  D[reset answer](#)

- B.   $\bigcirc^B$   
C.   $\bigcirc^C$   
D.   $\bigcirc^D$

*reset answer*

How many nonzero entries does the matrix representing the relation  $R$  on  
 $A = \{1, 2, 3, \dots, 100\}$  consisting of the first 100 positive integers have if  $R = \{(a, b)$

- 100  
99  
~~9900~~  
4950



**Q 10**

How many nonzero entries does the matrix representing the set

$$A = \{1, 2, 3, \dots, 100\}$$

consisting of the first 100 positive integers have?

A. 100

B. 99

C. 9900

D. 4950

Ops: A.  A

B.  B

C.  C

D.  D

D.  D

reset answer

Q 14

If  $f : \mathbb{Z} \times \mathbb{Z} \rightarrow \mathbb{Z}$  is a function, where  $\mathbb{Z}$  is the set of integers, then which of the functions is not a onto function?

A  $f(m, n) = m + n$

B  $f(m, n) = m^{\frac{1}{2}} - 4$

C  $f(m, n) = 2m - n$

D  $f(m, n) = m + n + 1$

Ops: A.  A

B.  B

C.  C

D.  D

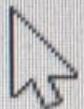
The recursive definition for the Fibonacci numbers are

Q 15

**Q 28**

How many comparisons are performed in order by the bubble sort algorithm?

- A 12
- B 13
- C 14
- D 15



**Ops:** A.  A

**Q 11**

How many comparisons are performed in sorting the sequence 6,2,3,1,4,5 in increasing order by the bubble sort algorithm?

- A 12
- B 13
- C 14
- D 15



**Ops:** A.  A

B.  B

C.  C

D.  D

Q 20

If  $R$  is a relation on the set of real numbers such that

- A reflexive
- B symmetric
- C antisymmetric
- D transitive

Ops:

- A.  A
- B.  B
- C.  C
- D.  D

D. O D

reset answer

Q 26  $3^n < n!$ , where  $n$  is an integer for

- A  $n > 3$
- B  $n > 4$
- C  $n > 5$
- D  $n > 6$

Ops: A  A

B  B

C  C

D.  D

Q 27

How many

Q 3

The recursive definition for the sequence  $\{a_n\}, n = 1, 2, 3, \dots$  if  $a_1 = 10^6$  is

- A  $a_{n+1} = 6a_n \quad \forall n \geq 1$
- B  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$
- C  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$
- D  $a_{n+1} = a_n \quad \forall n \geq 1$

- Ops:
- A
  - B
  - C
  - D

**Q 27**

If  $f(0) = 1$ ,  $f(n) = -f(n-1)$  for  
the formula for  $f(n)$  is given by

- A  $f(n) = (-1)^n$
- B  $f(n) = (-1)^{n+1}$
- C  $f(n) = (-2)^n$
- D  $f(n) = -1$

- B.  B  
C.  C  
D.  D

reset answer

7

### The recursive definition for the

- A  $a_{n+1} = 6a_n \quad \forall n \geq 1$   
B  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$   
C  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$   
D  $a_{n+1} = a_n \quad \forall n \geq 1$

- ps: A.  A  
B.  B  
C.  C  
D.  D

Q 8

What is the value of  $\sum_{i=1}^3 \sum_{j=0}^2 i$ ?

- A 18  
B 15  
C 12  
D 9

- A
- B
- C
- D

*reset answer*

Which rule of inference is used in the following argument?"If it snows today , the university will close. The university is not closed today. Therefore, it did not snow today."

- A Modus Ponens
- B Modus Tollens
- C Hypothetical Syllogism
- D Simplification

A  
B

View Answer

4. For any integer  $m \geq 3$ , the series  $2+4+6+\dots+(4m)$  can be equivalent to \_\_\_\_\_

- a)  $m^2+3$
- b)  $m+1$
- c)  $m^m$
- d)  $3m^2+4$

View Answer

Answer: a

Explanation: The required answer is  $m^2+3$ . Now, by induction assumption, we have to prove  $2+4+6+\dots+4(k+1) = (k+1)^2+3$  also can be true,  $2+4+6+\dots+4(k+1) = 2+4+6+\dots+(4k+4)$  and by the subsequent steps, we can prove that  $(m+1)^2+3$  also holds for  $m=k$ . So, it is proved.

5. For every natural number  $k$ , which of the following is true?

- a)  $(mn)^k = m^k n^k$
- b)  $m^*k = n + 1$

et...



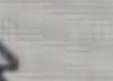
USAT for IIT JEE aspirants is here!  
Are you ready?  
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Every Sunday | 12 PM Onwards

 Enroll Now  
Use invite code USAT21

et...



**Q 18**

If a function assigns to a bit string the number of one bits  in the string  
the function is

- A the set of integers
- B the set of positive integers
- C the set of negative integers
- D the set of nonnegative integers

Q 23

If  $R$  is a relation on the set of real numbers such that  $(x, y) \in R$  iff  $x = 2y$ , then  $R$  is

- A reflexive
- B symmetric
- C antisymmetric
- D transitive

Ops: A.  A

B.  B

C.  C

D.  D

Q 25

How many w

women stand

A  $8!P(9, 5)$

B  $8!C(9, 5)$

C  $8P(9, 5)$

D  $9P(8, 5)$

Ops: A.  A

B.  B

C.  C

D.  D

reset answer



If R is a relation

A

B

**Q 22**

Among a group of 100 people there are atleast how many people who share the same birth month?

- A 10
- B 9
- C 8
- D 7

**Ops:** A.

B.  B

C.  C

D.  D

[reset answer](#)



**Q 23**

Which rule of inference is used in the following argument?"If it snows today , the ground will be white . Then if it is not cloudy . Then from which we can conclude that if it is not cloudy then the ground will be white ."

[reset answer](#)

**Q 11**

Which of the following is not a tautology?

- A  $(p \wedge (p \rightarrow q)) \rightarrow q$
- B  $(\neg q \wedge (p \rightarrow q)) \rightarrow \neg p$
- C  $(\neg p \wedge (p \rightarrow q)) \rightarrow \neg q$
- D  $((p \vee q) \wedge \neg p) \rightarrow q$

- Ops:**
- A.
  - B.
  - C.
  - D.

B       $M_{R^2} = \begin{bmatrix} 0 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

C       $M_{R^2} = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

D       $M_{R^2} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

**Ops:** A.  A

B.  B

C.  C

D.  D

reset answer

D.  D

---

Q 5

$3^n < n!$ , where  $n$  is an integer for

- A  $n > 3$
- B  $n > 4$
- C  $n > 5$
- D  $n > 6$

Ops: A.  A

B.  B

C.  C

D.  D

reset answer

---

C.  D

Q 28

If  $a_n = \left\lfloor \frac{n}{2} \right\rfloor + \left\lceil \frac{n}{2} \right\rceil$  is the  $n$ th term of a sequence then what is  $a_3$  ?

- A 1
- B 2
- C 3
- D 4

Ops: A  A

B  B

C  C

D  D

reset answer

C  C  
D  D  
reset answer

Q2

- How many positive integers between 1000 and 9999 inclusive  
by 72  
A 1540  
B 1541  
C 1542  
D 1543

Ops: A  A  
B  B  
C  C  
D  D  
reset answer

Q3

- Which of the following is true?  
A  $(p \wedge (p \rightarrow q)) \rightarrow q$   
B  $(\neg p \wedge (p \rightarrow q)) \rightarrow q$   
C  $(p \wedge (\neg p \rightarrow q)) \rightarrow q$   
D  $((p \wedge q) \rightarrow r) \rightarrow ((p \rightarrow r) \wedge (q \rightarrow r))$

Ops:

**Q 11**

If the matrix  $M_R = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \end{bmatrix}$  represents a  
given by

A  $M_{R^2} = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$



**Q 18**

The recursive definition for the sequence  $\{a_n\}, n = 1, 2, 3, \dots$  if  $a_1 = 10^n$  is

- A.  $a_{n+1} = 6a_n \quad \forall n \geq 1$
- B.  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$
- C.  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$
- D.  $a_{n+1} = a_n \quad \forall n \geq 1$

Ops: A.  A

B.  B

C.  C

D.  D

674324936701

**Q 19**

Which is not the inverse of 2 modulo 17?

- A. 9
- B. -8
- C. 10
- D. 26

Ops: A.  A

B.  B

C.  C



- C 2820  
D 2821

Ops: A.  A  
B.  B  
C.  C  
D.  D

reset answer

Q 18 Which is not the inverse of 2 modulo 17?

- A 9  
B -8  
 C 10  
D 26

Ops: A.  A  
 B  
 C  
 D

reset answer

Q 19 How many nonzero entries does the matrix representing the relation  $R$  on  
 $A = \{1, 2, 3, \dots, 100\}$  consisting of the first 100 positive integers have if  $R = \{(a, b) \mid a \neq b\}$ .

- A 100  
B 99  
 C 9900  
D 4950

[reset answer](#)

How many comparisons are performed in sorting the sequence 6,2,3,1,4,5 in increasing order by the bubble sort algorithm?

- A 12
- B 13
- C 14
- D 15

- A.  A
- B.  B
- C.  C
- D

D.  D

Q 7

What is the coefficient of  $x^5y^8$  in the expansion of  $(x+y)^{13}$ ?

- A 1200
- B 1250
- C 1287
- D 1288

Ops: A.  A

B.  B

C.  C

D.  D

[reset answer](#)

Q 8

Which elements of the poset  $(\{2, 4, 5, 10, 12, 20, 25\}, |)$  are maximal?

- A 25
- B 20 and 25
- C 12 and 25
- D 12, 20 and 25

Ops: A.  A

B.  B

C.  C

**Q 29**

How many nonzero entries does the  
 $A = \{1, 2, 3, \dots, 100\}$  consisting of the

- A 100
- B 99
- C 9900
- D 4950

C

Ops: A O A

C.  C

D.  D

[reset answer](#)

Q 11

If  $R$  is a relation on the set of real numbers such that  $(x, y) \in R$  iff  $x = 2y$ , then  $R$  is

A reflexive

B symmetric

C antisymmetric

D transitive

Ops: A.  A



B.  B

C.  C

D.  D

Q 12

Which of the following is not a Carmichael number?

Q 15

If  $f : Z \times Z \rightarrow Z$  is a function, where  $Z$  is the set of integers, then which of the functions is not a onto function?

- A  $f(m, n) = m + n$
- B  $f(m, n) = m^2 - 4$
- C  $f(m, n) = 2m - n$
- D  $f(m, n) = m + n + 1$

Ops: A.  A

B.  B

C.  C

D.  D

Q 16

**Q 5**

What is the hexadecimal representation of the

- A (80E)<sub>16</sub>
- B (8E)<sub>16</sub>
- C (10D)<sub>16</sub>
- D (E08)<sub>16</sub>

Ops: A  A

B.  B

C.  C

D.  D

reset answer

**D**  $f(m, n) = m + n + 1$

- A.  A
- B.  B
- C.  C
- D.  D

reset answer

The recursive definition for the sequence  $\{a_n\}, n = 1, 2, 3, \dots$  if  $a_1 = 10^8$  is

- A  $a_{n+1} = 6a_n \quad \forall n \geq 1$
- B  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$
- C  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$
- D  $a_{n+1} = a_n \quad \forall n \geq 1$

- A
- B
- C
- D

Q 7

Which elements of the poset  $(\{2, 4, 5, 10, 12, 20, 25\}, |)$  are

- A 25
- B 20 and 25
- C 12 and 25
- D 12, 20 and 25

Ops: A.

B.

C.

D.

Q 18

What is the value of  $\sum_{i=1}^3 \sum_{j=0}^2 i$ ?

- A 18
- B 15
- C 12
- D 9

Ops:

- A
- B
- C
- D

**Q 29**

Which elements of the poset  $(\{2, 4, 5, 10, 12, 20, 25\}, |)$  are maximal?

- A 25
- B 20 and 25
- C 12 and 25
- D 12, 20 and 25

Ops: A.  A

B.  B

C.  C

D.  D

23 : 32  
min sec

D.  D

reset answer

Q 27

Among a group of 100 people there are atleast how many people who share the same birth month?

A 10

B 9

C 8

D 7

14/85/439

Ops: A.  A

B.  B

C.  C

D.  D

A.  B

reset answer

Q 3

The recursive definition for the sequence  $\{a_n\}_{n=1,2,3,\dots}$  is

- A  $a_{n+1} = 6a_n \quad \forall n \geq 1$
- B  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$
- C  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$
- D  $a_{n+1} = a_n \quad \forall n \geq 1$

Ops: A.  A

B.  B

C.  C

Q 11

The recursive defi

A

$$f_n = f_{n-1} + f_{n-2}$$

B

$$f_n = f_{n-1} - f_{n-2}$$

C

$$f_n = 2f_{n-1} + f_{n-2}$$

D

$$f_n = f_{n-1} + 2f_{n-2}$$

Ops: A.  A

B.  B

C.  C

D.  D

[reset answer](#)

Q 12

If a function assigns  
the function is

A

the set of integers

B

the set of positive int

The recursive definition for the sequence  $\{a_n\}, n = 1, 2, 3, \dots$  is

- A  $a_{n+1} = 6a_n \quad \forall n \geq 1$
- B  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$
- C  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$
- D  $a_{n+1} = a_n \quad \forall n \geq 1$

s: A.



A

B.



B

C.

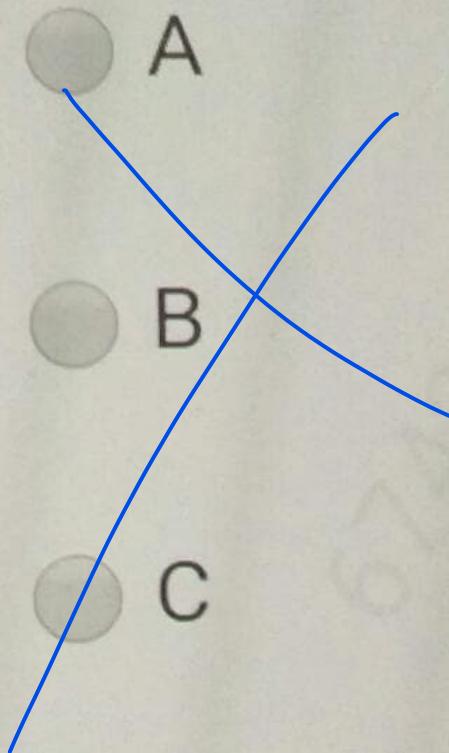


C

D.



D



- C     If there is no quiz, then I come to class.  
D     If I do not come to class, then there will not be a quiz.  
      If there is not going to be a quiz, then I do not come to class."

Ops: A.  A  
B.  B  
C.  C  
D.  D

reset answer

Q 3

If  $f: Z \times Z \rightarrow Z$  is a function, where  $Z$  is the set of integers, then which of the following functions is not a onto function?

- A      $f(m, n) = m + n$   
B      $f(m, n) = m^2 - 4$   
C      $f(m, n) = 2m - n$   
D      $f(m, n) = m + n + 1$

Ops: A.  A  
B.  B  
C.  C  
D.  D

reset answer

- Ops:**
- A.
  - B.
  - C.
  - D.

reset answer

---

**Q 2**

Which of the following two compound propositions are logically equivalent?

- A.  $\neg(p \leftrightarrow q)$  and  $p \leftrightarrow \neg q$
- B.  $(p \leftrightarrow q)$  and  $p \leftrightarrow \neg q$
- C.  $\neg(p \leftrightarrow q)$  and  $\neg p \rightarrow \neg q$
- D.  $\neg(p \leftrightarrow q)$  and  $\neg q \rightarrow p$

- Ops:**
- A.
  - B.
  - C.
  - D.

**Q 3**

If  $f : Z \times Z \rightarrow Z$  is a function, where  $Z$  is the set of integers, then which of the following functions is not a onto function?

- A.  $f(m, n) = m + n$

Which of the following set represents the equivalence congruence modulo 4?

- A  $\{..., -8, -4, 0, 4, 8, ...\}$
- B  $\{..., -7, -3, 1, 5, 9, ...\}$
- C  $\{..., -6, -2, 2, 6, 10, ...\}$
- D  $\{..., -5, -1, 3, 7, 11, ...\}$

- A.  A
- B.  B

**Q 17**

Which of the following set represents the equivalence class of 14 with respect to the congruence modulo 4?

- A {..., -8, -4, 0, 4, 8, ...}
- B {..., -7, -3, 1, 5, 9, ...}
- C {..., -6, -2, 2, 6, 10, ...}
- D {..., -5, -1, 3, 7, 11, ...}

**Ops:** A.

B.  B

C.  C

D.  D

Which of the following set represents the equivalence class of 1<sub>4</sub>

A. {...,-8,-4,0,4,8,...}

B. {...,-7,-3,1,5,9,...}

C. {...,-6,-2,2,6,10,...}

D. {...,-5,-1,3,7,11,...}

C  
 D

Ops: A.  A  
B.  B  
C.  C  
D.  D

**Q 3**

The recursive definition for the sequence  $\{a_n\}, n = 1, 2, 3,$

- A  $a_{n+1} = 6a_n \quad \forall n \geq 1$
- B  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$
- C  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$
- D  $a_{n+1} = a_n \quad \forall n \geq 1$

Ops: A.

B.

C.

D.

reset answer

Q 3

The recursive definition for the sequence  $\{a_n\}, n = 1, 2, 3, \dots$

- A  $a_{n+1} = 6a_n \quad \forall n \geq 1$
- B  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$
- C  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$
- D  $a_{n+1} = a_n \quad \forall n \geq 1$

- Ops:
- A.
  - B.
  - C.
  - D.

Q.13

If the matrix  $M_R = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \end{bmatrix}$  represents a relation  $R$  then the matrix representing  $R^2$  is given by

A  $M_{R^2} = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$

B  $M_{R^2} = \begin{bmatrix} 0 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

C  $M_{R^2} = \begin{bmatrix} 1 & 1 & 1 \\ 0 & 1 & 1 \\ 1 & 1 & 0 \end{bmatrix}$

D  $M_{R^2} = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$

The recursive definition for the sequence  $\{a_n\}$ ,  $n = 1, 2, 3, \dots$  if  $a_1 = 10^n$  is

A       $a_{n+1} = 6a_n \quad \forall n \geq 1$

B       $a_{n+1} = a_n + 6 \quad \forall n \geq 1$

C       $a_{n+1} = a_n - 6 \quad \forall n \geq 1$

D       $a_{n+1} = a_n \quad \forall n \geq 1$

DS: A.  A

B.  B



Q 22

The recursive definition for the sequence  $\{a_n\}, n=1,2,3,\dots$

A

$$a_{n+1} = 6a_n \quad \forall n \geq 1$$

B

$$a_{n+1} = a_n + 6 \quad \forall n \geq 1$$

C

$$a_{n+1} = a_n - 6 \quad \forall n \geq 1$$

D

$$a_{n+1} = a_n \quad \forall n \geq 1$$

Ops: A.  A

B.  B

C.  C

D.  D

16

How many nonzero entries does the matrix representing  
 $A = \{1, 2, 3, \dots, 100\}$  consisting of the first 100 positive in

- A 100
- B 99
- C 9900
- D 4950

s: A.  A  
B.  B  
C.  C

D.  D

Q8

If a function assigns to a bit string the number of one bits in the string then the range of the function is

- A the set of integers
- B the set of positive integers
- C the set of negative integers
- D the set of nonnegative integers

Ops: A.  A

B.  B

C.  C

D.  D

Q9

What is the hexadecimal representation of the binary expansion  $(100000001110)_2$ ?

A.  $(80E)_{16}$

Q 26

A

561

B

1729

C

2820

D

2821

Which of the following is not a Carmichael

Ops: A.  A

B.  B

C.  C

D.  D

D.

Q 2

Which is the inverse of the conditional statement " I come to class whenever there is going to be a quiz."

- A. If I come to class, then there will be no quiz.
- B. If there is no quiz, then I come to class.
- C. If I do not come to class, then there will not be a quiz.
- D. If there is not going to be a quiz, then I do not come to class."

Ops: A.  A

B.  B

C.  C

D.  D

[reset answer](#)

Q 3

If  $A$  and  $B$  are two sets then

- A.  $(A \cap B) \subseteq A$
- B.  $(A \cup B) \subseteq A$
- C.  $(A \cap B) \subseteq (A - B)$
- D.  $(A \cup B) \subseteq (A - B)$

Ops: A.  A

B.  B

C.  C

D.  D

[reset answer](#)

**Q 25**

Which of the following set represents the equivalence class of 14 with respect to the congruence modulo 4?

- A  $\{..., -8, -4, 0, \cancel{8}, 8, ...\}$
- B  $\{..., -7, -3, 1, 5, 9, ...\}$
- C  $\{..., -6, -2, 2, 6, 10, ...\}$
- D  $\{..., -5, -1, 3, 7, 11, ...\}$

**Ops:** A.

B.

C.

D.

[reset answer](#)

**Q 26**

Which of the following is the linear combination representing  $\gcd(21, 55)$ ?

- B.  B
- C.  C
- D.  D

reset answer

Q 16

Which of the following set represents the equivalence class of 14 with respect to the congruence modulo 4?

- A.  $\{..., -8, -4, 0, 4, 8, \dots\}$
- B.  $\{..., -7, -3, 1, 5, 9, \dots\}$
- C.  $\{..., -6, -2, 2, 6, 10, \dots\}$
- D.  $\{..., -5, -1, 3, 7, 11, \dots\}$

Ops: A.  A

B.  B

C.  C

D.  D

Q 17

Which of the following is not a Carmichael number?

- A. 561
- B. 1729
- C.  2820
- D. 2821

**Q 10**

What is the value of  $\sum_{i=1}^3 \sum_{j=0}^2 i$ ?

- A 18
- B 15
- C 12
- D 9

- A.  A
- B.  B
- C.  C
- D.  D

How many ways are there to select 11 unordered elements from  
when repetition is allowed?

A 3  
B 33  
C 78  
D 11

- Ops:  
A.  A  
B.  B  
C.  C  
D.  D

reset answer

Q 6

If  $f(0) = 1$ ,  $f(n) = -f(n-1)$   
the formula for  $f(n)$  is

A  $f(n) = (-1)^n$   
B  $f(n) = n!$   
C  $f(n) = \frac{1}{n!}$   
D  $f(n) = n^n$

**Q 19**

Atleast, which amount of postag

- A 35 cents
- B 36 cents
- C 34 cents
- D 33 cents

**Ops:** A.  A

B.  B

**Q 16**

How many comparisons are performed in sorting the sequence 6,2,3,1,4,5 in increasing order by the bubble sort algorithm?

- A 12  
B 13  
C 14  
D 15

Ops: A.  A

B.  B

C.  C

D.  D

**Q 17**

Which is the inverse of the conditional statement "I come to class whenever there is

**Q 11**



If the matrix  $M_R = \begin{bmatrix} 0 & 1 & 0 \\ 0 & 1 & 1 \\ 1 & 0 & 0 \end{bmatrix}$  represents a  
given by

A

$$M_{R^2} = \begin{bmatrix} 0 & 1 & 1 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$

Which of the following is not a tautology?

- A  $(p \wedge (p \rightarrow q)) \rightarrow q$
- B  $(\neg q \wedge (p \rightarrow q)) \rightarrow \neg p$
- C  $(\neg p \wedge (p \rightarrow q)) \rightarrow \neg q$
- D  $((p \vee q) \wedge \neg p) \rightarrow q$

A

B

C

D

24

If a function assigns to a bit string the number of one bits in the function is

- A the set of integers
- B the set of positive integers
- C the set of negative integers
- D the set of nonnegative integers

ps: A.  A

B.  B

C.  C

D.  D

reset answer

Q 25

The recursive definition for the sequence  $\{a_n\}, n = 1, 2, 3, \dots$  if

- A  $a_{n+1} = 6a_n \quad \forall n \geq 1$
- B  $a_{n+1} = a_n + 6 \quad \forall n \geq 1$
- C  $a_{n+1} = a_n - 6 \quad \forall n \geq 1$
- D  $a_{n+1} = a_n \quad \forall n \geq 1$

Dps: A.  A



B.  B

C.  C

D.  D

Q 26

What is the hexadecimal representation of the binary expansion

(80E)<sub>16</sub>

B (8E)<sub>16</sub>

C

D.  D

*reset answer*



Which of the following two compound propositions are logically equivalent?

A  $\neg(p \leftrightarrow q)$  and  $p \leftrightarrow \neg q$

B  $(p \leftrightarrow q)$  and  $p \leftrightarrow \neg q$

C  $\neg(p \leftrightarrow q)$  and  $\neg p \rightarrow \neg q$

D  $\neg(p \leftrightarrow q)$  and  $\neg q \rightarrow p$

A

B

C

D