Discrete Maths Daily Quiz # 1

1. Which of these sentences are not propositions? What are the truth values of those that are propositions? (Mark all the correct options)

   A. Boston is the capital of Massachusetts.

   B. Miami is the capital of Florida.

   C. $2 + 3 = 5$.

   D. $5 + 7 = 10$.

   E. $x + 2 = 11$.

   F. Answer this question.

Discrete Maths Daily Quiz # 2

2. The following propositional statement is: $\neg((\neg P) \wedge Q) \leftrightarrow (P \rightarrow Q)$
   A. Tautology
   B. Contradiction
   C. Contingent
   D. More than one of these

Discrete Maths Daily Quiz # 3

3. The number of propositional functions on n variables?

   A. 2^n

   B. 2^{2^n}

   C. n^{2^n}

   D. n^{n^2}

GATE AND TECH

Discrete Maths Daily Quiz # 4

4. The proposition $p \wedge (\sim p \vee q)$ is logically equivalent to _____

   A. tautology

   B. logically equivalent to $p \wedge q$

   C. logically equivalent to $p \vee q$

   D. none

Discrete Maths Daily Quiz # 5

5. The binary operation $\square$ is defined as follows

p	q	p $\square$ q
T	T	T
T	F	T
F	T	F
F	F	T

Which one of the following is equivalent to p $\vee$ q?

A. $\sim q \square \sim$ p B. $p \square \sim q$ C. $\sim p \square q$ D. $\sim p \square \sim q$

Discrete Maths Daily Quiz # 6

6. **(TIFR 2023)** Consider the following two statements:

   (P) The current population of Bhutan is greater than the current population of India.

   (Q) The Moon is smaller than the Earth. Clearly, (P) is false, while (Q) is true. Which of the following logical statements evaluates to true?

   A. $\neg P \Rightarrow Q$

   B. $Q \Rightarrow P$

   C. $\neg(P \Rightarrow Q)$

   D. $P \Leftrightarrow Q$

Discrete Maths Daily Quiz # 7

7. **(UGC NET 2017)** In propositional logic if $(P \to Q) \wedge (R \to S)$ and $(P \vee R)$ are two premises such that

$$\frac{\begin{array}{c}(P \to Q) \wedge (R \to S) \\ P \vee R\end{array}}{Y}$$

Y is the premise : (Mark all the correct options)

A. $P \vee R$

B. $P \vee S$

C. $Q \vee R$

D. $Q \vee S$

Discrete Maths Daily Quiz # 8

8. **(UGC NET 2015)** In propositional logic, given P and $P \rightarrow Q$, we can infer _____ (Mark all the correct options)

   A. $\sim Q$

   B. Q

   C. $P \wedge Q$

   D. $\sim P \wedge Q$

Discrete Maths Daily Quiz # 9

9. Which statement is/are true?

S1: A formula is valid iff its complement is not satisfiable

S2: A formula is satisfiable iff its complement is not valid.

A. Only S1

B. Only S2

C. Both S1 and S2

D. None

Discrete Maths Daily Quiz # 10

10. If S_d is a dual of S then $(S_d)_d \equiv$

A. $\sim S$

B. S

C. T

D. F

GATE AND TECH

Discrete Maths Daily Quiz # 11

11. How many n-variable propositional functions (distinct) are there such that their truth tables have equal numbers of true and false?

    A. $2^{2^{n-1}}$

    B. $2^{2^{n/2}}$

    C. ${}^{2^n}C_{2^{n-1}}$

    D. None

Discrete Maths Daily Quiz # 12

12. Which of the following statements is the contrapositive of the statement, "You win the game if you know the rules but are not overconfident."

A. If you lose the game then you don't know the rules or you are overconfident.

B. A sufficient condition that you win the game is that you know the rules or you are not overconfident.

C. If you don't know the rules or are overconfident you lose the game.

D. A necessary condition that you know the rules or you are not overconfident is that you win the game.

GATE AND TECH

Discrete Maths Daily Quiz # 13

13. A sufficient condition that a triangle T be a right triangle is that $a^2+b^2 = c^2$. An equivalent statement is _____ (Mark all the correct options)

    A. If T is a right triangle then $a^2 + b^2 = c^2$.

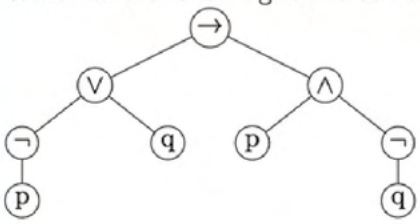
    B. If $a^2 + b^2 = c^2$ then T is a right triangle.

    C. T is a right triangle only if $a^2 + b^2 = c^2$.

    D. T is a right triangle unless $a^2 + b^2 = c^2$.

Discrete Maths Daily Quiz # 14

14. Which of the following formulas has the parse tree:



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

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

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

D. $(p \vee \neg q) \rightarrow (p \wedge \neg q)$

Discrete Maths Daily Quiz # 15

15. Which of the following arguments is valid? (Mark all the correct options)
    A. It is snowing or it is raining. It is snowing, therefore it is raining.
    B. If there is snow, I will go snowboarding. If I go snowboarding, I will skip the class. There is snow, therefore I will skip the class.
    C. I am rich or I don't have to work. I am not rich or I like playing hockey. Therefore I have to work or I like playing hockey.
    D. If you are blonde then you are not smart. You are smart therefore you are blonde.

Discrete Maths Daily Quiz # 16

16. Let P and Q be two predicates.

Which of the following is correct?

i. $\forall x P(x) \vee \forall x Q(x) \implies \forall x [P(x) \vee Q(x)]$

ii. $\forall x [P(x) \vee Q(x)] \implies \forall x P(x) \vee \forall x Q(x)$

iii. $\exists x [P(x) \wedge Q(x)] \iff \exists x P(x) \wedge \exists x Q(x)$

iv. $\exists x [P(x) \vee Q(x)] \iff \exists x P(x) \vee \exists x Q(x)$

A. Only i, iii
B. Only i, iv
C. Only i, ii, iv
D. All of i, ii, iii and iv

GATE AND TECH

Discrete Maths Daily Quiz # 17

17. Which of the following formulas does not express that there is at most one element of D that has property $P(x)$?

A. $\forall x_1, x_2 \in D\left[P\left(x_1\right) \wedge P\left(x_2\right) \rightarrow x_1 = x_2\right]$

B. $\forall x_1, x_2 \in D\left[x_1 \neq x_2 \rightarrow \neg P\left(x_1\right) \vee \neg P\left(x_2\right)\right]$

C. $\neg \exists x_1, x_2 \in D\left[x_1 \neq x_2 \wedge P\left(x_1\right) \wedge P\left(x_2\right)\right]$

D. $\neg \exists x_1, x_2 \in D\left[P\left(x_1\right) \wedge x_1 \neq x_2 \rightarrow \neg P\left(x_2\right)\right]$

GATE AND TECH

Discrete Maths Daily Quiz # 18

18. We use the dictionary:

M	domain of men
s	Sharon
$N(x)$	x is nice
$L(x,y)$	x loves y

Which of the following formulas corresponds to the sentence:

There is a nice man who loves Sharon.

A. $\exists x \in M[N(x) \wedge L(x,s)]$

B. $\exists x \in M[N(x) \rightarrow L(x,s)]$

C. $\forall x \in M[N(x) \wedge L(x,s)]$

D. $\forall x \in M[N(x) \rightarrow L(x,s)]$

Discrete Maths Daily Quiz # 19

19. Consider the following statements

$$S1 : \forall x(P(x) \vee A) \equiv (\forall x P(x)) \vee A$$
$$S2 : \forall x(P(x) \wedge A) \equiv \forall x P(X) \wedge A$$

Which of the following is valid?

A. S1 only

B. S2 only

C. S1 and S2 both

D. Neither S1 nor S2

Discrete Maths Daily Quiz # 20

20. Consider the following statements

$$S1 : \forall x[P(x) \vee Q(x)] \Leftrightarrow \forall x P(x) \vee \forall x Q(x)$$
$$S2 : \exists x[P(x) \wedge Q(x)] \Leftrightarrow \exists x P(x) \wedge \exists x Q(x)$$

Which of the following is true?

A. S1 only

B. S2 only

C. S1 and S2 both

D. Neither S1 nor S2

Discrete Maths Daily Quiz # 21

21. $(\forall x P(x) \vee \exists y P(y))$ is equivalent to _____

A. $\exists x(P(x))$

B. $(\forall x P(x))$

C. $\neg(\forall x P(x))$

D. $\neg(\exists x P(x))$

Discrete Maths Daily Quiz # 22

22. Which of the following is/are correct?

There is a student who is loved by every other student.

A. $\exists x(\text{Student}(x) \wedge \forall y(\text{Student}(y) \wedge \neg(x = y) \wedge \text{Loves}(y, x)))$

B. $\exists x(\text{Student}(x) \rightarrow \forall y(\text{Student}(y) \wedge \neg(x = y) \wedge \text{Loves}(y, x)))$

C. $\exists x(\text{Student}(x) \wedge \forall y(\text{Student}(y) \wedge \neg(x = y) \vee \text{Loves}(y, x)))$

D. $\exists x(\text{Student}(x) \wedge \forall y(\text{Student}(y) \wedge \neg(x = y) \rightarrow \text{Loves}(y, x)))$

Discrete Maths Daily Quiz # 23

23. Which of the following statements is/are False?

A. $\exists x(P(x) \rightarrow Q(x)) \equiv \forall x P(x) \rightarrow \exists x Q(x)$

B. $\exists x(P(x) \vee Q(x)) \equiv \exists x(P(x)) \vee \exists x(Q(x))$

C. $\forall x(P(x) \wedge Q(x)) \equiv \forall x(P(x)) \wedge \forall x(Q(x))$

D. $\exists x(P(x) \wedge Q(x)) \equiv \exists x(P(x)) \wedge \exists x(Q(x))$

Discrete Maths Daily Quiz # 24

24. Which of the following first-order logic statements are equivalent?

A. $\sim \forall \mathbf{x}\{\mathbf{P}(\mathbf{x}) \vee \exists \mathbf{y}[\mathbf{Q}(\mathbf{y}) \wedge \mathbf{P}(\mathbf{y})]\} \equiv \exists \mathbf{x}\{\sim \mathbf{P}(\mathbf{x}) \wedge \forall \mathbf{y}[(\mathbf{P}(\mathbf{y}) \rightarrow \sim Q(y)) \vee (\mathbf{Q}(\mathbf{y}) \rightarrow \sim P(\mathbf{y}))]\}$

B. $\sim \forall \mathbf{x}\{\mathbf{P}(\mathbf{x}) \vee \exists \mathrm{y}[\mathrm{Q}(\mathrm{y}) \wedge \mathbf{P}(\mathbf{y})]\} \equiv \exists \mathbf{x}\{\sim \mathbf{P}(\mathbf{x}) \wedge \forall \mathbf{y}[\sim (\mathbf{P}(\mathbf{y}) \rightarrow \sim Q(y)) \vee (\sim \mathrm{Q}(\mathrm{y}) \rightarrow \sim \mathrm{P}(\mathrm{y}))]\}$

C. $\sim \forall \mathbf{x}\{\mathbf{P}(\mathbf{x}) \vee \exists \mathbf{y}[\mathbf{Q}(\mathbf{y}) \wedge \mathbf{P}(\mathbf{y})]\} \equiv \exists \mathbf{x}\{\sim \mathbf{P}(\mathbf{x}) \wedge \forall \mathbf{y}[(\mathbf{P}(\mathbf{y}) \rightarrow \sim Q(y)) \vee (\sim \mathbf{Q}(\mathbf{y}) \rightarrow \sim \mathbf{P}(\mathbf{y}))]\}$

D. $\sim \forall \mathbf{x}\{\mathbf{P}(\mathbf{x}) \vee \exists \mathbf{y}[\mathbf{Q}(\mathbf{y}) \wedge \mathbf{P}(\mathbf{y})]\} \equiv \exists \mathbf{x}\{\sim \mathbf{P}(\mathbf{x}) \wedge \forall \mathbf{y}[\sim (\mathbf{P}(\mathbf{y}) \rightarrow \sim Q(y)) \vee (\mathbf{Q}(\mathbf{y}) \rightarrow \sim \mathbf{P}(\mathbf{y}))]\}$

Discrete Maths Daily Quiz # 25

25. Which of the following formulas is a formalization of the sentence: "There is a computer which is not used by any student"

A. $\exists x(\text{Computer}(x) \wedge \forall y(\neg\,\text{Student}(y) \wedge \neg\text{Uses}(y,x)))$

B. $\exists x(\text{Computer}(x) \rightarrow \forall y(\text{Student}(y) \rightarrow \neg\text{Uses}(y,x)))$

C. $\exists x(\text{Computer}(x) \wedge \forall y(\text{Student}(y) \rightarrow \neg U\ \text{Uses}(y,x)))$

D. $\exists x(\text{Computer}(x) \rightarrow \forall y(\neg\,\text{Student}(y) \wedge \neg\text{Uses}(y,x)))$

Discrete Maths Daily Quiz # 26

26. Consider the following statement

$$\exists x \exists y(\text{parent}(x, \text{Ramu}) \wedge \text{parent}(y, \text{Ramu}))$$

where parent (x, y) means x is a parent of y. Which of the following statements is true about the above first-order logic statement?

A. Ramu has at least one parent

B. Ramu has at least two parents

C. Ramu has at most one parent

D. Ramu has at most two parents

GATE AND TECH

Discrete Maths Daily Quiz # 27

27.

$$S_1 : \forall_x (P(x) \to A) \equiv \exists_x P(x) \to A$$
$$S_2 : \exists_x (P(x) \to A) \equiv \forall_x P(x) \to A$$

Which of the following statements is true?

A. Only S1

B. Only S2

C. Both S1 and S2

D. Neither S1 nor S2

GATE AND TECH

Discrete Maths Daily Quiz # 28

28. Consider a domain $S = \{1, 2, 3, 4\}$

$$P(x, y) : x * y \geq 2$$

Which of the following statements is true? (Mark all the correct options)

A. $\forall x \forall y P(x, y)$

B. $\forall x \exists y P(x, y)$

C. $\exists x \forall y P(x, y)$

D. $\exists x \exists y P(x, y)$

GATE AND TECH

Discrete Maths Daily Quiz # 29

29. Which of the following FOL statements is incorrect? (Mark all the correct options)

i. $\forall n \in \mathbb{N}.\exists m \in \mathbb{N}.n < m$

ii. $\exists n \in \mathbb{N}.\forall m \in \mathbb{N}.n < m$

iii. $\forall n \in \mathbb{N}.\forall m \in \mathbb{N}.(n < m \rightarrow \exists p \in \mathbb{N}.(n < p \wedge p < m))$

iv. $\forall n \in \mathbb{R}.\forall m \in \mathbb{R}.(n < m \rightarrow \exists p \in \mathbb{R}.(n < p \wedge p < m))$

v. $\forall n \in \mathbb{N}.\forall m \in \mathbb{N}.\exists p \in \mathbb{N}.(n = p \cdot m)$

vi. $\forall \mathrm{n} \in \mathbb{R}.\forall \mathrm{m} \in \mathbb{R}.\exists p \in \mathbb{R}.(n = p \cdot m)$

A. i, ii, iii

B. ii, iii

C. ii, v, vi

D. ii, iii, vi

Discrete Maths Daily Quiz # 30

30. Which of the following is/are valid? (Mark all the appropriate answers)

A. $P(A) \Rightarrow \forall x P(x)$

B. $P(A) \Rightarrow \forall x \neg P(x)$

C. $P(A) \Rightarrow \exists x P(x)$

D. $P(A) \Rightarrow \exists x \neg P(x)$

GATE AND TECH

Discrete Maths Daily Quiz # 31

2. Set Theory & Algebra

31. Which of the following statements is FALSE?

A. $\{2,3,4\} \subseteq A$ implies that $2 \in A$ and $\{3,4\} \subseteq A$.

B. $\{2,3,4\} \in A$ and $\{2,3\} \in B$ implies that $\{4\} \subseteq A - B$.

C. $A \cap B \supseteq \{2,3,4\}$ implies that $\{2,3,4\} \subseteq A$ and $\{2,3,4\} \subseteq B$.

D. $A - B \supseteq \{3,4\}$ and $\{1,2\} \subseteq B$ implies that $\{1,2,3,4\} \subseteq A \cup B$.

Discrete Maths Daily Quiz # 32

32. Let $A = \{0,1\} \times \{0,1\}$ and $B = \{a,b,c\}$. Suppose A is listed in lexicographic order based on $0 < 1$ and B is in alphabetic order. If $A \times B \times A$ is listed in lexicographic order, then the next element after $((1,0),c,(1,1))$ is _____.

A. $((1,0),a,(0,0))$

B. $((1,1),c,(0,0))$

C. $((1,1),a,(0,0))$

D. $((1,1),b,(1,1))$

Discrete Maths Daily Quiz # 33

33. Which of the following statements is TRUE? (Mark all the appropriate choices)

A. For all sets A, B, and $C, A - (B - C) = (A - B) - C$.

B. For all sets A, B, and $C, (A - B) \cap (C - B) = (A \cap C) - B$.

C. For all sets A, B, and $C, (A - B) \cap (C - B) = A - (B \cup C)$.

D. For all sets A, B, and C, if $A \cap C = B \cap C$ then $A = B$.

Discrete Maths Daily Quiz # 34

34. Consider the true theorem, "For all sets A and B, if $A \subseteq B$ then $A \cap B^c = \emptyset$." Which of the following statements is NOT equivalent to this statement: (Mark all the appropriate choices)

A. For all sets A^c and B, if $A \subseteq B$ then $A^c \cap B^c = \emptyset$.

B. For all sets A and B, if $A^c \subseteq B$ then $A^c \cap B^c = \emptyset$.

C. For all sets A^c and B^c, if $A^c \subseteq B^c$ then $A^c \cap B = \emptyset$.

D. For all sets A and B, if $A^c \supseteq B$ then $A \cap B = \emptyset$.

GATE AND TECH

Discrete Maths Daily Quiz # 35

35. The power set $\mathcal{P}((A \times B) \cup (B \times A))$ has the same number of elements as the power set $\mathcal{P}((A \times B) \cup (A \times B))$ if and only if

A. $A = \emptyset$ or $B = \emptyset$

B. $B = \emptyset$ or $A = B$

C. $A = \emptyset$ or $B = \emptyset$ or $A = B$

D. $A = \emptyset$ or $B = \emptyset$ or $A \cap B = \emptyset$

Discrete Maths Daily Quiz # 36

36. Let $\mathcal{P}(A)$ denote the power set of A. If $\mathcal{P}(A) \subseteq B$ then

A. $2^{|A|} \leq |B|$

B. $2^{|A|} \geq |B|$

C. $2|A| < |B|$

D. $2^{|A|} \geq 2^{|B|}$

Discrete Maths Daily Quiz # 37

37. Let $f : \{1,2,3,4,5,6,7,8,9\} \to \{a,b,c,d,e\}$. In one-line notation, $f = (e,a,b,b,a,c,c,a,c)$ (use number order on the domain).

Which is correct? (Mark all the appropriate choices)

A. Image $(f) = \{a,b,c,d,e\}$, Coimage $(f) = \{\{6,7,9\},\{2,5,8\},\{3,4\},\{1\}\}$

B. Image $(f) = \{a,b,c,e\}$, Coimage $(f) = \{\{6,7,9\},\{2,5,8\},\{3,4\}\}$

C. Image $(f) = \{a,b,c,e\}$, Coimage $(f) = \{\{6,7,9\},\{2,5,8\},\{3,4\},\{1\}\}$

D. Image $(f) = \{a,b,c,d,e\}$, Coimage $(f) = \{\{1\},\{3,4\},\{2,5,8\},\{6,7,9\}\}$

Discrete Maths Daily Quiz # 38

38. The number of partitions of $\{1,2,3,4,5\}$ into three blocks is $S(5,3) = 25$. The total number of functions $f : \{1,2,3,4,5\} \to \{1,2,3,4\}$ with $|\text{Image(f)}| = 3$ is _____.

A. 4×25

B. 25×6

C. $4 \times 25 \times 6$

D. $3 \times 25 \times 6$

Discrete Maths Daily Quiz # 39

39. Let $f : X \to Y$ and $g : Y \to Z$. Let $h = g \circ f : X \to Z$. Suppose g is one-to-one and onto. Which of the following is/are FALSE? (Mark all the appropriate choices)

    A. If f is one-to-one then h is one-to-one and onto.

    B. If f is not onto then h is not onto.

    C. If f is not one-to-one then h is not one-to-one.

    D. If f is one-to-one then h is one-to-one.

GATE AND TECH

Discrete Maths Daily Quiz # 40

40. Define $f(n) = \frac{n}{2} + \frac{1-(-1)^n}{4}$ for all $n \in \mathbb{Z}$. Thus, $f : \mathbb{Z} \to \mathbb{Z}, \mathbb{Z}$ the set of all integers. Which is/are correct? (Mark all the appropriate choices)

A. f is not a function from $\mathbb{Z} \to \mathbb{Z}$ because $\frac{n}{2} \notin \mathbb{Z}$.

B. f is a function and is onto and one-to-one.

C. f is a function and is not onto and not one-to-one

D. f is a function and is onto but not one-to-one.

Discrete Maths Daily Quiz # 41

41. Let $f : X \to Y$. Consider the statement, "For all subsets C and D of $Y, f^{-1}(C \cap D^c) = f^{-1}(C) \cap \left[f^{-1}(D)\right]^c$. This statement is

A. True and equivalent to: For all subsets C and D of $Y, f^{-1}(C - D) = f^{-1}(C) - f^{-1}(D)$.

B. False and equivalent to: For all subsets C and D of $Y, f^{-1}(C - D) = f^{-1}(C) - f^{-1}(D)$.

C. True and equivalent to: For all subsets C and D of $Y, f^{-1}(C - D) = f^{-1}(C) - \left[f^{-1}(D)\right]^c$.

D. False and equivalent to: For all subsets C and D of $Y, f^{-1}(C - D) = f^{-1}(C) - \left[f^{-1}(D)\right]^c$.

Discrete Maths Daily Quiz # 42

42. Which of the following is/are correct? (Mark all the appropriate choices)

A. If $f : X \to Y$ is one-to-one, then $|X| \leq |Y|$, and if f is onto, then $|X| \geq |Y|$, so if f is both, $|X| = |Y|$.

B. If $f : X \to Y$ is a one-to-one and onto, then f^{-1} is a one-to-one and onto function.

C. The number of injective functions from a set with three elements to a set with four elements is 24.

D. The number of surjective functions from a set with four elements to a set with three elements is 36.

Discrete Maths Daily Quiz # 43

43. If the number of binary relations on a set A, where $|A| = 5$ is α. Then the value of $\alpha^0 + \alpha$ is _____. (Numerical Answer Type)

Discrete Maths Daily Quiz # 44

44. Let $\mathbb{N}^+$ denote the nonzero natural numbers. Define a binary relation R on $\mathbb{N}^+ \times \mathbb{N}^+$ by $(m,n)R(s,t)$ if $\gcd(m,n) = \gcd(s,t)$. The binary relation R is _____.

A. Reflexive, Not Symmetric, Transitive

B. Reflexive, Symmetric, Transitive

C. Reflexive, Symmetric, Not Transitive

D. Reflexive, Not Symmetric, Not Transitive

Discrete Maths Daily Quiz # 45

45. Given that $A = \{1, 2, 3, 4\}$ and R is the relation defined by $(x, y) \in R$ if $3x + 2y \leq 11$

Which of the following statements is true?

A. It is reflexive

B. It is symmetric

C. It is transitive

D. None of the above

Discrete Maths Daily Quiz # 46

46. Let $\mathbb{N}_2^+$ denote the natural numbers greater than or equal to 2. Let mRn if $\gcd(m,n) > 1$. The binary relation R on $\mathbb{N}_2$ is _____.

A. Reflexive, Symmetric, Not Transitive

B. Reflexive, Not Symmetric, Transitive

C. Reflexive, Not Symmetric, Not Transitive

D. Not Reflexive, Symmetric, Not Transitive

Discrete Maths Daily Quiz # 47

47. Let R and S be binary relations on a set A. Suppose that R is reflexive, symmetric, and transitive and that S is symmetric, and transitive but is not reflexive. Which statement is always true for any such R and S?

A. $R \cup S$ is symmetric but not reflexive and not transitive.

B. $R \cup S$ is transitive and symmetric but not reflexive.

C. $R \cup S$ is reflexive and symmetric.

D. $R \cup S$ is symmetric but not transitive.

Discrete Maths Daily Quiz # 48

48. Define an equivalence relation R on the positive integers $A = \{2, 3, 4, \ldots, 20\}$ by mRn if the largest prime divisor of m is the same as the largest prime divisor of n. The number of equivalence classes of R is _____.

(Numerical Answer Type)

Discrete Maths Daily Quiz # 49

49. Let $R = \{(a,a),(a,b),(b,b),(a,c),(c,c)\}$ be a partial order relation on $\Sigma = \{a,b,c\}$. Let $\preceq$ be the corresponding lexicographic order on Σ^*. Which of the following is/are true? (Mark all the appropriate choices)

A. $bc \preceq ba$

B. $abbaaacc \preceq abbaab$

C. $abbac \preceq abbab$

D. $abbac \preceq abbaac$

Discrete Maths Daily Quiz # 50

50. Consider the divides relation, $m \mid n$, on the set $A = \{2, 3, 4, 5, 6, 7, 8, 9, 10\}$. The cardinality of the covering relation for this partial order relation (i.e., the number of edges in the Hasse diagram) is _____.

A. 4

B. 6

C. 5

D. 7

GATE AND TECH

Discrete Maths Daily Quiz # 51

51. Consider the divides relation, $m \mid n$, on the set $A = \{2, 3, 4, 5, 6, 7, 8, 9, 10\}$. Which of the following permutations of A is not a topological sort of this partial order relation?

A. $2, 3, 7, 6, 9, 5, 4, 10, 8$

B. $2, 6, 3, 9, 5, 7, 4, 10, 8$

C. $3, 7, 2, 9, 5, 4, 10, 8, 6$

D. $3, 2, 6, 9, 5, 7, 4, 10, 8$

Discrete Maths Daily Quiz # 52

52. Let $A = \{2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16\}$ and consider the divides relation on A. Let C denote the length of the maximal chain, M the number of maximal elements, and m the number of minimal elements. Which is true?

A. $C = 3, M = 8, m = 6$

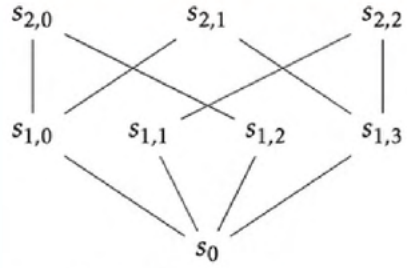
B. $C = 4, M = 8, m = 6$

C. $C = 3, M = 6, m = 6$

D. $C = 4, M = 6, m = 4$

Discrete Maths Daily Quiz # 53

53. Given the following Hasse diagram, which of the following is correct?



A. Join semi lattice
B. Meet semi lattice
C. Lattice
D. Not a lattice

Discrete Maths Daily Quiz # 54

54. Which of the following is/are correct? (Mark all the appropriate choices)

A. If there is a distributive lattice, then every element should have at most one compliment.

B. If there is a complemented lattice, then every element should have at least one complement.

C. If there is a Boolean lattice, then every element has exactly one complement.

D. None of the above

Discrete Maths Daily Quiz # 55

55. Which of the following is/are correct? (Mark all the appropriate choices)

A. If $(G,*)$ is a group and $a \in G$, then $a*a=a$ implies $a=e$.

B. A group $(G,*)$ is abelian if $a*b=b*a$ for all elements $a,b \in G$.

C. If G is a group, H and K are two subgroups of G, then $H \cap K$ is also a subgroup of G.

D. Let $G=G_1 \times G_2$ be a finite group with $\gcd(|G_1|,|G_2|)=1$. Then every subgroup H of G is of the form $H=H_1 \times H_2$ where H_i is a subgroup of G_i for $i=1,2$.

Discrete Maths Daily Quiz # 56

56. Let G be a finite group on 243 elements. The size of the largest possible proper subgroup of G is _____. (Numerical Answer Type)

Discrete Maths Daily Quiz # 57

57. What is the number of elements in the cyclic subgroup of $\mathbb{Z}_{30}$ generated by 25? (Numerical Answer Type)

Discrete Maths Daily Quiz # 58

58. Let G be a group with order 45, and H a non-abelian subgroup of G. Assuming $H \neq G$,what is the largest order of H?
(Numerical Answer Type)

Discrete Maths Daily Quiz # 59

59. Suppose G is a group that has exactly 48 distinct elements of order 5. How many distinct subgroups of order 5 does G have?

A.12

B.16

C.6

D.4

GATE AND TECH

Discrete Maths Daily Quiz # 60

60. Let $G = \langle a \rangle$. Find the smallest subgroup of G containing a^{2020} and a^{1719} is?

A. a^4

B. a^{1719}

C. a^{2020}

D. a^1

Discrete Maths Daily Quiz # 61

61. How many edges are there in a graph with 40 vertices each of degree 4? (Numerical Answer Type)

Discrete Maths Daily Quiz # 62

62. What is the largest possible number of vertices in a graph with 35 edges and all vertices of degree at least 3? (Numerical Answer Type)

Discrete Maths Daily Quiz # 63

63. Which of the following is true?

S1: The number of directed simple graphs with n-vertices is 2^{n^2-n}.

S2: The number of un-directed simple graphs with n-vertices is $2^{\binom{n}{2}}$.

A. Only S1

B. Only S2

C. Both S1 and S2

D. Neither S1 nor S2

Discrete Maths Daily Quiz # 64

64. A graph has 26 vertices and 58 edges. There are five vertices of degree 4, six vertices of degree 5, and seven vertices of degree 6. If the remaining vertices all have the same degree, what is this degree? (Numerical Answer Type)

Discrete Maths Daily Quiz # 65

65. A graph has 24 vertices and 30 edges. It has five vertices of degree 4, seven pendant vertices, and seven vertices of degree 2. All other vertices have degree 3 or 4. How many vertices of degree 4 are there? (Numerical Answer Type)

Discrete Maths Daily Quiz # 66

66. What is the maximum number of vertices on a graph that has 35 edges and every vertex has degree ≥ 3? (Numerical Answer Type)

Discrete Maths Daily Quiz # 67

67. The following statements are given below:

S1: If all vertices in a graph, G, have odd degree, k. Then k divides $|E(G)|$.

S2: The compliment of a graph, G, of order n, denoted $\overline{G}$, has the same vertex set as G with $E(\overline{G}) = E(K_n) - E(G)$. If every vertex of G has an odd degree, except for one, then there are $n - 1$ vertices that have odd degrees in $\overline{G}$.

Which of the following is correct?

A. S2 Only

B. S1 Only

C. S2 and S1 both

D. Neither S2 nor S1

Discrete Maths Daily Quiz # 68

68. Which of the following is/are correct? (Mark all the appropriate choices)

A. If two graphs have the same number of vertices with the same quantity and order cycles, then they are isomorphic.

B. Two isomorphic graphs must have the same number of edges and vertices.

C. Two isomorphic graphs always look exactly the same.

D. Isomorphism is an equivalence relation on all graphs.

Discrete Maths Daily Quiz # 69

69. Which of the following is/are incorrect? (Mark all the appropriate choices)

A. The degree sequence of two isomorphic graphs must be the same.

B. $K_{3,2}$ is isomorphic to C_5.

C. $K_{4,2}$ is isomorphic to $K_{2,4}$.

D. If G contains no cycles, all graphs isomorphic to G also have no cycles.

Discrete Maths Daily Quiz # 70

70. Which of the following is/are incorrect? (Mark all the appropriate choices)

A. Any graph in which all vertices have even degree contains an Eulerian circuit.

B. A closed walk contains a cycle.

C. A graph with multiple components can contain an Eulerian cycle.

D. If a connected graph has $n = 2k$ vertices, for some positive integer k, all with odd degree, then there are k disjoint trails containing every edge.

Discrete Maths Daily Quiz # 71

71. Which of the following is/are correct? (Mark all the appropriate choices)

A. A graph of order $n \geq 4$ that contains a triangle cannot be Hamiltonian.

B. Every Hamiltonian graph contains a Hamiltonian path.

C. If there exists a Hamiltonian path between any two vertices in a graph, then the graph is Hamiltonian.

D. A graph $K_{m,n}$ is Hamiltonian if and only if $m = n$, with $m, n \geq 2$.

Discrete Maths Daily Quiz # 72

72. For which of the following does there exist a simple graph $G = (V, E)$ satisfying the specified conditions? (Mark all the appropriate choices)

A. It has 6 vertices, 11 edges, and more than one component.

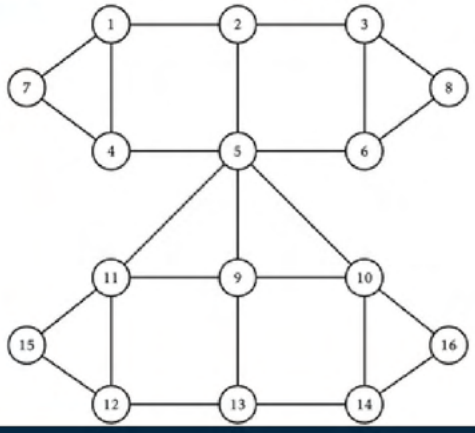
B. It is connected and has 10 edges 5 vertices and fewer than 6 cycles.

C. It has 7 vertices, 10 edges, and more than two components.

D. It has 8 vertices, 8 edges, and no cycles.

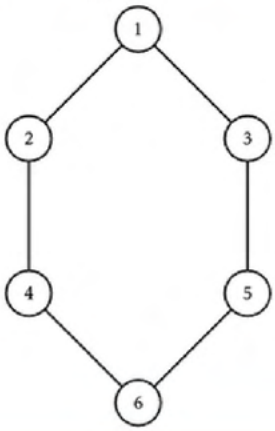
Discrete Maths Daily Quiz # 73

73. If the number of articulation points in the graph is α then the value of $2024^{\alpha!}$ =? (Numerical Answer Type)



Discrete Maths Daily Quiz # 74

74. How many Hamiltonian paths are there on the graph? (Numerical Answer Type)

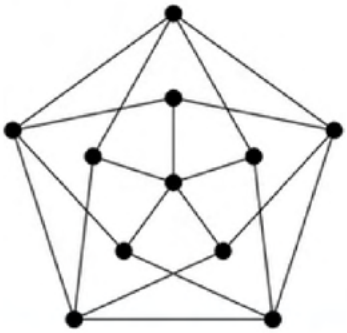


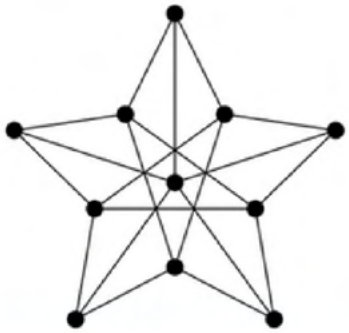
Discrete Maths Daily Quiz # 75

75. If a simple graph has 5 component and these components have $4, 5, 6, 7, 8$ vertices, then the maximum number of edges present in the graph? (Numerical Answer Type)

Discrete Maths Daily Quiz # 76

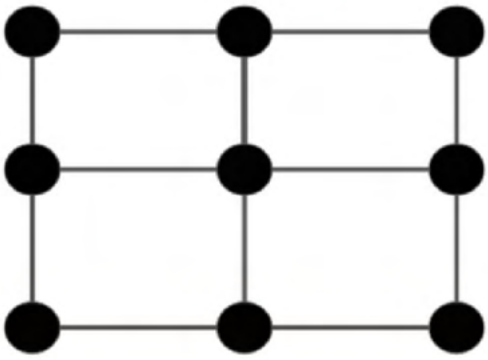
76. If the girth and circumference of the following graphs are α and β respectively, then the value of $\alpha + \beta$ =? (Numerical Answer Type)





Discrete Maths Daily Quiz # 77

77. What is the least number of nodes you can have to make a minimum vertex cover of this graph? (Numerical Answer Type)



Discrete Maths Daily Quiz # 78

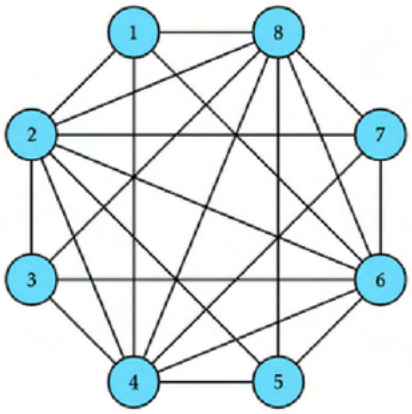
78. The number of perfect matchings in complete graphs with 6 vertex is α. Then the value of α^2 is _____. (Numerical Answer Type)

Discrete Maths Daily Quiz # 79

79. The number of perfect matching in $K_{7,7}$ is β, then the value of $\frac{\beta}{6!}$ is _____. (Numerical Answer Type)

Discrete Maths Daily Quiz # 80

80. Number of the maximum independent vertex set of this graph is γ, then the value of $(\gamma!)^{\gamma}$ is _____. (Numerical Answer Type)



Discrete Maths Daily Quiz # 81

81. Which of the following is/are correct? (Mark all the appropriate choices)

A. If G is a simple graph with 15 edges and $\bar{G}$ has 13 edges, then the number of vertices in G is 8.

B. If The maximum number of edges in a simple graph with 10 vertices and 4 components is 21.

C. For which value of k an acyclic graph G with 17 vertices, 8 edges, and k components exist? Let $e_i, n_i, 1 \leq i \leq k$ represents the number of edges, and number of vertices in component i, respectively.

D. Find the minimum number of vertices in a simple graph with 13 edges and having 5 vertices of degree 4 and the rest having a degree less than 3.

Discrete Maths Daily Quiz # 82

82. The maximum number of edges in a bipartite graph with 19 vertices is? (Numerical Answer Type)

Discrete Maths Daily Quiz # 83

83. Which of the following is/are correct? (Mark all the appropriate choices)

A. If G is a graph with $E \leq 3V - 6$ then G is planar.

B. The subgraph of any planar graph is planar.

C. Every planar graph of order 4 or more contains at least one vertex of degree 5 or less.

D. If G has order 11, then at least one of G or $\overline{G}$ is non-planar.

Discrete Maths Daily Quiz # 84

84. Which of the following is/are correct? (Mark all the appropriate choices)

A. Let G be a connected, planar graph with at least 4 vertices. Prove that the number of regions is bounded above by $2\,V - 4$.

B. If G is a connected planar graph where $E = 3V - 6$ then every region of G is a triangle.

C. Let G be a planar graph where $\delta(G) \geq 5$. Show that G has at least 12 vertices.

D. A connected, planar graph with order 22 has no more than 60 edges.

Discrete Maths Daily Quiz # 85

85. Which of the following is/are correct? (Mark all the appropriate choices)

A. If $\chi(G) = 3$ then G contains a triangle.

B. If a planar graph contains a triangle, then $\chi(G) = 3$.

C. Isomorphic graphs have the same chromatic number.

D. Homeomorphic graphs have the same chromatic number.

Discrete Maths Daily Quiz # 86

86. Which of the following is/are correct? (Mark all the appropriate choices)

A. Any Hamiltonian graph with $\chi(G) = 2$ is planar.

B. A graph is bipartite if and only if it has chromatic number 2.

C. If $\chi(G) \leq 4$ then G is planar.

D. If $\chi(G) = n$, then G contains a subgraph isomorphic to K_n.

Discrete Maths Daily Quiz # 87

87. Which of the following is/are correct? (Mark all the appropriate choices)

A. If there exists a 4 -colouring of G then $\chi(G) = 4$.

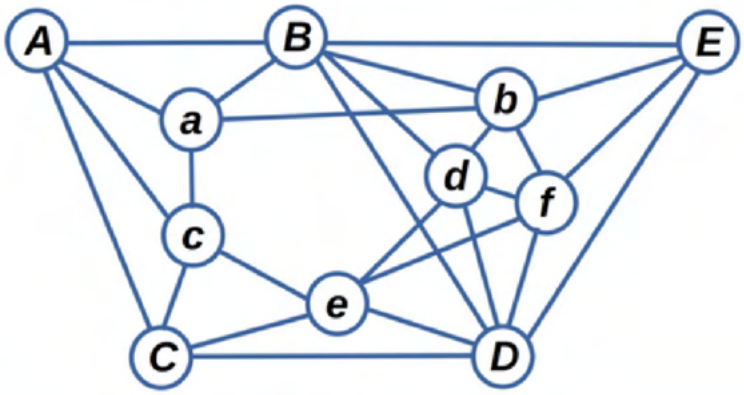
B. If G contains a subgraph isomorphic to K_n then $\chi(G) \geq n$.

C. If we can prove G has no 3-colouring then $\chi(G) = 4$.

D. If every region of a planar graph is bounded by an even number of edges, then there exists a 2-colouring of the graph.

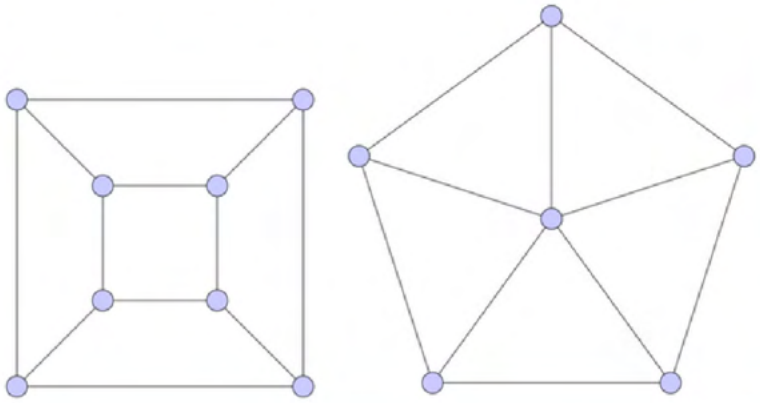
Discrete Maths Daily Quiz # 88

88. If the Chromatic number of below graph is α, then the value of $\alpha!$ is _____. (Numerical Answer Type)



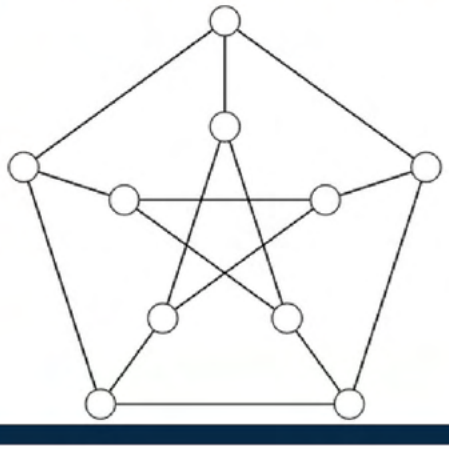
Discrete Maths Daily Quiz # 89

89. If the minimum edge colouring, and minimum vertex colouring for the following graphs are α, β respectively, then the value of $\alpha + \beta =$?



Discrete Maths Daily Quiz # 90

90. If the chromatic number of this graph is α, and the edge chromatic number is β, then the value of $\alpha! + \beta! = ?$ (Numerical Answer Type)



Discrete Maths Daily Quiz # 91

4. Combinatorics

91. In New Hampshire, license plates consisted of two letters followed by 3 digits. How many possible license plates are there? (Numerical Answer Type)

Discrete Maths Daily Quiz # 92

92. How many legal configurations are there in Towers of Hanoi with n rings?

A. 3^n

B. 2^n

C. 2^n

D. 4^n

Discrete Maths Daily Quiz # 93

93. Joselyn stops by a sandwich shop on her way home from class. The shop sells 4 types of potato chips, 3 types of cookies, 7 different drinks, and 10 different sandwiches. She is interested in determining how many different ways there are to order if she'd either like a drink and a cookie, or a meal which includes a sandwich, a drink, and chips. (Numerical Answer Type)

Discrete Maths Daily Quiz # 94

94. How many nonempty sets of letters can be formed from 3 X's and 5 Y's? (Numerical Answer Type)

Discrete Maths Daily Quiz # 95

95. If $A = \{1, 2, 3\}, B = \{a, b, c, d\}, C = \{\alpha, \beta, \gamma, \chi, \lambda\}$, how many distinct 3-tuples are there in the set $A \times B \times C$? (Numerical Answer Type)

Discrete Maths Daily Quiz # 96

96. A group of eight would sit in a row at the movie theater, how many ways can arrange themselves if Andrew and Asiya refuse to sit beside each other? (Numerical Answer Type)

Discrete Maths Daily Quiz # 97

97. Eli wakes up every morning and makes himself a smoothie with frozen fruit. He picks 3 fruits every day to make his smoothie with out of the 10 options types of fruit in his freezer. He likes any combination of fruit in his smoothie except banana with apple. How many ways are there for Eli to make his smoothie? (Mark all the appropriate choices)

A. $\binom{10}{3}-\binom{8}{1}$

B. $\binom{9}{1}+\binom{9}{2}+\binom{8}{3}$

C. $\binom{10}{2}-\binom{8}{1}$

D. $\binom{9}{2}+\binom{9}{2}+\binom{8}{3}$

Discrete Maths Daily Quiz # 98

98. Parents are distributing the last of the Halloween candies between their four children. There are seven packs of Skittles and six chocolate bars, in how many ways can these parents distribute the candy such that each child gets at least one pack of Skittles? (Numerical Answer Type)

Discrete Maths Daily Quiz # 99

99. How many integer solutions are there to the inequality,

$$x_1 + x_2 + x_3 + x_4 + x_5 < 20,$$

where $x_i \geq 0$ for $1 \leq i \leq 5$? (Numerical Answer Type)

Discrete Maths Daily Quiz # 100

100. Hannah is buying two dozen loaves of bread at a bakery out of n options. The bakery has more than three dozen of each type and Hannah is okay with repetition. If she can select the bread in 593 775 different ways, how many different types of bread does the bakery have? (Numerical Answer Type) Note: one dozen = 12.

Discrete Maths Daily Quiz # 101

101. How many people must attend a conference to ensure that at least two attendees share the same first and last initial? (Numerical Answer Type)

Discrete Maths Daily Quiz # 102

102. How many integers in $X = \{0,\ldots,60\}$ must be chosen to ensure that an odd integer is selected? (Numerical Answer Type)

Discrete Maths Daily Quiz # 103

103. There are 500 families that live in the neighbourhood of South Brambleton. 100 of these families have no children and no pets. 300 families have pets, and 400 have children. How many homes in South Brambleton have both of children and pets living in them? (Numerical Answer Type)

Discrete Maths Daily Quiz # 104

104. A standard 12-hour clock has hour, minute, and second hands. How many times do two hands cross between 1:00 and 2:00 (not including 1:00 and 2:00 themselves)? (Numerical Answer Type)

Discrete Maths Daily Quiz # 105

105. A permutation of the first n positive integers is quadratic if, for some positive integers a and b such that $a + b = n, a \neq 1$, and $b \neq 1$, the first a integers of the permutation form an increasing sequence and the last b integers of the permutation form a decreasing sequence, or if the first a integers of the permutation form a decreasing sequence and the last b integers of the permutation form an increasing sequence. How many permutations of the first 10 positive integers are quadratic? (Numerical Answer Type)

Discrete Maths Daily Quiz # 106

106. The population of the US is 300 million. Every person has written somewhere between 0 and 10 million lines of code. What's the maximum number of people that we can say must have written the same number of lines of code? (Numerical Answer Type)

Discrete Maths Daily Quiz # 107

107. There are 38 different time periods during which classes at a university can be scheduled. If there are 677 different classes, what is the minimum number of different rooms that will be needed? (Numerical Answer Type)

GATE AND TECH

Discrete Maths Daily Quiz # 108

108. Kalil is interviewing for jobs at 5 different companies where each job has a two-part interview. He has 5 interview-appropriate outfits. Kalil wants to wear each outfit once for each round of interviews, but does not want to wear the same outfit to the second part of an interview as he wore to the first. How many ways can he do this? (Numerical Answer Type)

Discrete Maths Daily Quiz # 109

109. How many possible six-figure salaries (in whole dollar amounts) are there that contain at least three distinct digits? (Numerical Answer Type)

Discrete Maths Daily Quiz # 110

110. Mickey the mailman is very lazy. He has received 10 parcels to 10 different people. However, because he is lazy, he doesn't bother reading the address and delivers them off randomly. In how many ways can Mickey deliver the parcels such that no one gets the right parcel? (Numerical Answer Type)

Discrete Maths Daily Quiz # 111

111. Suppose $a_0 = 2, a_1 = 7$ and $a_{n+1} = -a_n + 5a_{n-1}$ for $n \geq 1$. The value of a_6 (without solving the recurrence relation) is _____. (Numerical Answer Type)

GATE AND TECH

Discrete Maths Daily Quiz # 112

112. Solve the recurrence relation $a_n = -2a_{n-1}$, where $a_0 = 5$. (Mark all the appropriate choices)

A. $a_n = 5 \cdot (-3)^n$ for $n \geq 0$.

B. $a_n = 5 \cdot (-1)^n$ for $n \geq 0$.

C. $a_n = 5 \cdot (-2)^n$ for $n \geq 0$.

D. $a_n = 3 \cdot (-2)^n$ for $n \geq 0$.

GATE AND TECH

Discrete Maths Daily Quiz # 113

113. Leora puts money in a high-interest savings account to help save for university. The interest is 8% annually and compounds monthly. If she deposits $1500.00 on the day she opens the account, how much money will she have after 16 months? Use recurrence relations to solve this problem.

A. $1668.25

B. $1667.25

C. $1666.25

D. $1665.25

GATE AND TECH

Discrete Maths Daily Quiz # 114

114. Suppose the amount of bacteria in a container triples every hour. If initially there are only 5 bacteria, how many bacteria are in the container after a day and a half? (Mark all the appropriate choices)

A. $5 \cdot \left(3^{36}\right)$

B. $5 \cdot \left(3^{35}\right)$

C. $5 \cdot \left(3^{34}\right)$

D. $5 \cdot \left(3^{32}\right)$

GATE AND TECH

Discrete Maths Daily Quiz # 115

115. Consider the recurrence relation $a_1 = 8, a_n = 6n^2 + 2n + a_{n-1}$. The value of a_{99} is _____. (Numerical Answer Type)

Discrete Maths Daily Quiz # 116

116. A bus driver pays all tolls, using only nickels and dimes, by throwing one coin at a time into the mechanical toll collector.

Find a recurrence relation for the number of different ways the bus driver can pay a toll of n cents (where the order in which the coins are used matters). (Mark all the appropriate choices)

A. $a_k = a_{k+1} + a_{k-2}$, where $a_0 = 1, a_1 = 1$

B. $a_k = a_{k-1} + a_{k+2}$, where $a_0 = 1, a_1 = 1$

C. $a_k = a_{k+1} + a_{k+2}$, where $a_0 = 1, a_1 = 1$

D. $a_k = a_{k-1} + a_{k-2}$, where $a_0 = 1, a_1 = 1$

Discrete Maths Daily Quiz # 117

117. A bus driver pays all tolls, using only nickels and dimes, by throwing one coin at a time into the mechanical toll collector.

In how many different ways can the driver pay a toll of 45 cents? (where the order in which the coins are used matters). (Numerical Answer Type)

GATE AND TECH

Discrete Maths Daily Quiz # 118

118. What is the characteristic equation of

$$C_0 a_n = -C_1 a_{n-1} + C_2 a_{n-2}$$

for $n \geq 2$?

A. $C_0 r^2 - C_1 r + C_2 = 0$

B. $C_0 r^2 + C_1 r + C_2 = 0$

C. $C_0 r^2 + C_1 r - C_2 = 0$

D. $C_0 r^2 - C_1 r - C_2 = 0$

GATE AND TECH

Discrete Maths Daily Quiz # 119

119. Find a recurrence relation for the number of binary sequences of length n that have no consecutive 0's. Note: A binary sequence is sequence made up of only the digits " 0 " and " 1 ".

A. $a_n = a_{n-1} - a_{n-2}$ for $n \geq 3$ with $a_1 = 2$ and $a_2 = 3$

B. $a_n = -a_{n-1} + a_{n-2}$ for $n \geq 3$ with $a_1 = 2$ and $a_2 = 3$

B. $a_n = -a_{n-1} - a_{n-2}$ for $n \geq 3$ with $a_1 = 2$ and $a_2 = 3$

C. $a_n = a_{n-1} + a_{n-2}$ for $n \geq 3$ with $a_1 = 2$ and $a_2 = 3$

GATE AND TECH

Discrete Maths Daily Quiz # 120

120. Suppose a recurrence relation of the form $a_n = c_1 a_{n-1} + c_2 a_{n-2}$ has a general solution $a_n = A_1 3^n + A_2 6^n$. The value of $c_1 - c_2$ =? (Numerical Answer Type)

Discrete Maths Daily Quiz # 121

121. In how many ways can 1000 identical pamphlets be distributed to five different counselling centers, where pamphlets are put in stacks of 50, such that each center receives at least 50 but no more than 500 pamphlets? (Numerical Answer Type)

Discrete Maths Daily Quiz # 122

122. Determine the number of ways that \$12 in loonies can be distributed between a father's three children so that the eldest gets at least four dollars, the middle and youngest child are both guaranteed at least two dollars, but the youngest cannot receive any more than \$5 since he will spend it all on candy and rot his teeth. (Numerical Answer Type)

Discrete Maths Daily Quiz # 123

123. The coefficient of x^4 in the expansion of $\left(1+x+x^2+x^3\right)^{11}$ is _____.

A. 900

B. 909

C. 990

D. 999

GATE AND TECH

Discrete Maths Daily Quiz # 124

124. Let the coefficient of the middle term of the binomial expansion of $(1+x)^{2n}$ be α and those of two middle terms of the binomial expansion of $(1+x)^{2n-1}$ be β and γ. Which one of the following relations is correct?

A. $\alpha > \beta + \gamma$

B. $\alpha < \beta + \gamma$

C. $\alpha = \beta + \gamma$

D. $\alpha = \beta\gamma$

Discrete Maths Daily Quiz # 125

125. If $a_i (i = 0, 1, 2, \ldots, 16)$ be real constants such that for every real value of $x, \left(1 + x + x^2\right)^8 = a_0 + a_1 x + a_2 x^2 + \ldots + a_{16} x^{16}$, then a_5 is equal to _____.

A. 502

B. 504

C. 506

D. 508

Discrete Maths Daily Quiz # 126

126. What is the generating function corresponding to the Fibonacci series?

$$F_n = F_{n-1} + F_{n-2}.$$

Note that $F_0 = F_1 = 1$.

A. $G(x) = \frac{1}{1+x-x^2}$

B. $G(x) = \frac{1}{1-x-x^2}$

C. $G(x) = \frac{1}{1-x+x^2}$

D. $G(x) = \frac{1}{1+x+x^2}$

GATE AND TECH

Discrete Maths Daily Quiz # 127

127. The coefficient of $\left[x^{50}\right]\left(x^6+x^7+x^8+\ldots\right)^6$ is _____. (Mark all the appropriate choices)

A. $\binom{19}{5}$

B. $\binom{18}{6}$

C. $\binom{19}{14}$

D. $\binom{18}{12}$

Discrete Maths Daily Quiz # 128

128. What will be the coefficient of x^{100}?

$$\frac{1}{(1-x^{10})(1-x^{20})(1-x^{50})}$$

(Numerical Answer Type)

Discrete Maths Daily Quiz # 129

129. The coefficient of x^{83} in $(x^5+x^8+x^{11}+x^{14}+x^{17})^{10}$ is _____. (Numerical Answer Type)

Discrete Maths Daily Quiz # 130

130. What is the coefficient of x^6 in the following series expansion? (Numerical Answer Type)

$$\frac{1}{1-x} \cdot \frac{1}{1-x^2} \cdot \frac{1}{1-x^3} \cdots$$