Discrete Structures

IIIT Hyderabad

Monsoon 2020

Tutorial 1

September 18, 2020

Introduction

Tutorial Timings

The tutorials will be held on

Monday and Wednesday, 1-2PM.

Any change or cancellations in slot will be informed in prior.

Tutorial Format

Tutorial sessions will cover -

- Solve some problems (3 - 4) related to the lectures.
- Will discuss previous Assignment or Quiz solutions.
- Try to address doubts.

Question 1

1.1. Find the power set (or $\mathcal{P}(S)$) and it's order (or $|\mathcal{P}(S)|$) for the following sets -

- Set $S = \{\phi\}$
- Set $S = \{\text{a}\}$
- Set $S = \{\text{a}, \phi\}$
- Set $S = \{\text{a}, \{\phi\}\}$
- Set $S = \{\phi, \{\phi\}, \{\{\phi\}\}\}$

1.2. If $|A| = m$ and $|B| = n$ and A and B are not mutually disjoint. Let

$$\mathcal{P}_i(S) = \mathcal{P}(\mathcal{P}(\mathcal{P} \ldots \mathcal{P}(S)))) \ i \text{ times}$$

then what are the bounds of the value of $|\mathcal{P}_4(A - B)|$, $|\mathcal{P}_2(A - B)|$.
*[On the basis of above, can you tell about $|\mathcal{P}_4(A - B) - \mathcal{P}_2(A - B)|$?]

Question 2

For answering this question, go to: tinyurl.com/dstut1

True or False:

1. $\phi \subseteq \{\phi\}$
2. $\{x^2 | x^2 = 1\} = \{x | x^2 = x\}$
3. $\mathcal{P}(\{x, y, \{x\}, \{y\}) = \mathcal{P}(\{x, y, \{x, y\})$
4. $\{a, \phi\} \in \{a\}$
5. $\{a, \phi\} \subseteq \{a, \{a, \phi\}\}$
6. If $a \in \mathcal{P}(A)$, then $a \in A$ always.
7. For any set A, $A \subseteq A$
8. For any set A, $A \in A$
9. Every nonempty set has at least two subsets

Question 3

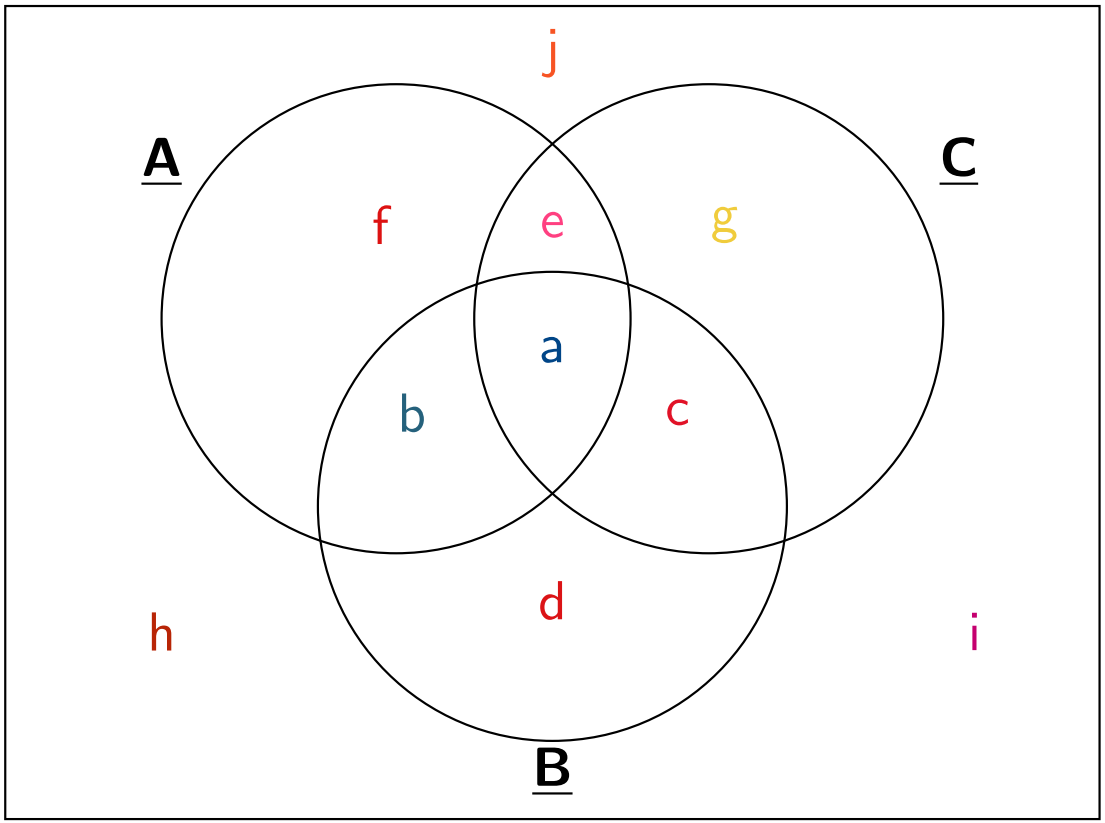
3.1 Given $A = \{a, b, \{a, c\}, \phi\}$. Determine the following:

- $A - \phi$
- $A - \{a, c\}$
- $A - \{\{a, c\}\}$
- $\{a, c\} - A$

3.2 One of the following set is different, which one ? (Choose one, MCQ) ($\wedge$ is **AND** and $\vee$ is **OR**)

1. Set $S = \{x | (x^2 = 1) \vee (x^2 = 4) \vee (x \text{ is prime} < 10)\}$
2. Set $S = \{x | (x^2 = 4) \vee (x^2 = 1) \vee (x \text{ is odd} < 10)\}$
3. Set $S = \{x | x < 9 \wedge x > -3 \wedge ((x \text{ is odd}) \vee (x^2 = 4))\}$
4. Set $S = \{-2, -1, 1, 2, 3, 5, 7\}$

Question 4



1. (U - (A ∩ B))' ∪ ((C - B) ∩ A')
2. (A ∩ C') ∪ (A ∪ B ∪ C)'
3. (A - (B ∩ C)) ∩ (U' - (C ∩ B))'

Any more doubts/queries ?

Feel free to ping us on Teams or Messenger, or mail us.

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