The more you practice the more you are approaching towards your goal

LIVE @10pm

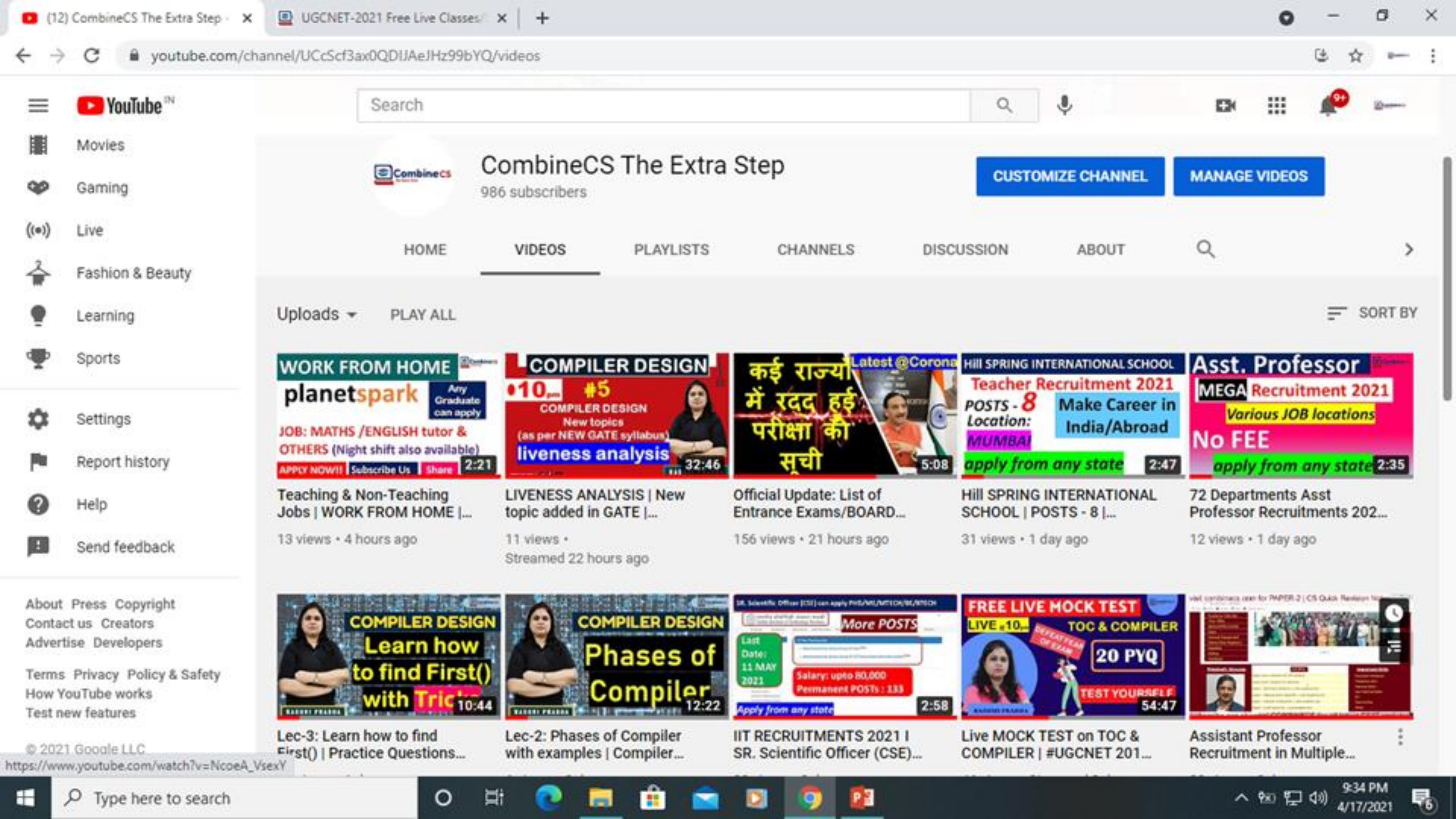
Target UGC NET

Theory of computation

MOCK-2

Tricks

PAPER-2	MCQ/PYQ	Top Videos	EMN (Tricks)	Old Papers
AI	GATE 2020 Part-1	HOPFIELD NETWORK in AI	30Days Crash Course CSE	NOV 2020
SE	Bigdata Expected MCQ Part-1/2	FEATURE DRIVEN DEVELOPMENT (FDD) in Agile methodology	Last Minute Revision	
Discrete		Comparison between Software Process Models	Expected MOCK 2021	
TOC		UML Expected Ques.	SUPERVISED vs UNSUPERVISED	
COA			Types of SUPERVISED LEARNING	
DBMS			DECIDABILITY Property	
OOps			CLOSURE property	
Bigdata				
CG				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Q1) Let N be an NFA with n states. Let k be the number of states of a minimal DFA which is equivalent to N. Which one of the following is necessarily true?

1. $k \geq 2n$
2. $k \leq 2n$
3. $k \geq n$
4. $k \leq n2$

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The number of states in DFA is always less than equal to 2no. of states in NFA
In other words, if number of states in NFA is "n" then the corresponding DFA have at most 2n states.
Hence $k \leq 2n$ is necessarily true.

Q2) The set of all recursively enumerable languages is ….

1. closed under complementation.
2. closed under intersection.
3. a subset of the set of all recursive languages.
4. an uncountable set.

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Q3) Consider the language L given by the regular expression (a+b)*b(a+b) over the alphabet {a, b}. The smallest number of states needed in deterministic finite- state automation (DFA) accepting L is_________.

1. 4
2. 5
3. 6
4. 7

Q3) Consider the language L given by the regular expression (a+b)*b(a+b) over the alphabet {a, b}. The smallest number of states needed in deterministic finite- state automation (DFA) accepting L is________.

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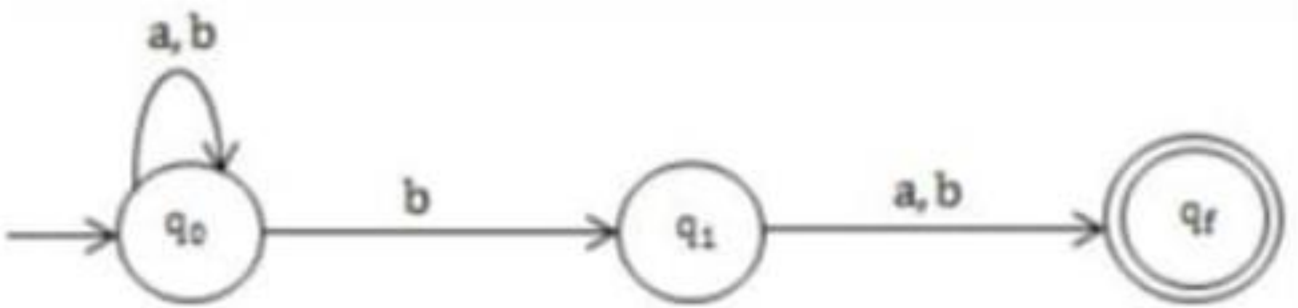

States ↓ / Input →	a	b
→ $[q_0]$	$[q_0]$	$[q_0 q_1]$
$[q_0 q_1]$	$[q_0 q_f]$	$[q_0 q_1 q_f]$
$[q_0 q_f]$	$[q_0]$	$[q_0 q_1]$
$[q_0 q_1 q_f]$	$[q_0 q_f]$	$[q_0 q_1 q_f]$

Q4) Consider the following statements:

i)The complement of every Turing decidable language is Turing decidable.

ii)There exists some language which is in NP but is not Turing decidable.

iii)If L is a language in NP, L is Turing decidable.

Which of the above statements is/are True?

a) Only II

b) Only III

c) Only I and II

d) Only I and III

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$P \rightarrow xQRS$

$Q \rightarrow yz \mid z$

$R \rightarrow w \mid \varepsilon$

$S \rightarrow y$

Q5) Calculate follow (Q) ..?

1. {w, y}
2. {w, $}
3. {w}
4. None

$P \rightarrow xQRS$

$Q \rightarrow yz \mid z$

$R \rightarrow w \mid \varepsilon$

$S \rightarrow y$

Q5) Calculate follow (Q) ..?

1. {w, y}
2. {w, $}
3. {w}
4. None

Q6) Which of the following statements about parser is/are CORRECT?

I. Canonical LR is more powerful than SLR

II. SLR is more powerful than LALR.

III. SLR is more powerful than Canonical LR.

1. I only
2. II only
3. III only
4. II and III only

Q6) Which of the following statements about parser is/are CORRECT?

I. Canonical LR is more powerful than SLR

II. SLR is more powerful than LALR.

III. SLR is more powerful than Canonical LR.

1. I only
2. II only
3. III only
4. II and III only

Canonical LR is more powerful than SLR as every grammar which can be parsed by SLR parser, can also be parsed by CLR parser.
The power in increasing order is: LR(0) < SLR < LALR < CLR
Hence only I is true.

Q7) Which one of the following grammars is free from left recursion?

a)
S --> Aa|Bb|c
A --> Bd|ε
B --> Ae|ε

b)
S --> Ab|Bb|C
A --> Bd|ε
B --> e

c)
S --> Aa|B
A --> Bb|Ac|ε
B --> e

d)
S --> AB
A --> Aa|b
B --> C

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d)
S --> AB
A --> Aa|b
B --> C

Q8) Which of the following are decidable?

I. Whether the intersection of two regular languages is infinite

II. Whether a given context-free language is regular

III. Whether two push-down automata accept the same language

IV. Whether a given grammar is context-free

a) I and II

b) II and III

c) I and IV

d) II and IV

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a) I and II

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c) I and IV

d) II and IV

Q9) Among simple LR (SLR), canonical LR, and look-ahead LR (LALR), which of the following pairs identify the method that is very easy to implement and the method that is the most powerful, in that order?

1. SLR, LALR
2. Canonical LR, LALR
3. SLR, canonical LR
4. LALR, canonical LR

Q9) Among simple LR (SLR), canonical LR, and look-ahead LR (LALR), which of the following pairs identify the method that is very easy to implement and the method that is the most powerful, in that order?

1. SLR, LALR
2. Canonical LR, LALR
3. SLR, canonical LR
4. LALR, canonical LR

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Q10) Which one of the following problems is undecidable?

1. Deciding if a given string is generated by a given context-free grammar.
2. Deciding if a given context-free grammar is ambiguous.
3. Deciding if the language generated by a given context-free grammar is finite.
4. Deciding if the language generated by a given context-free grammar is empty.

Q10) Which one of the following problems is undecidable?

1. Deciding if a given string is generated by a given context-free grammar. - Membership
2. Deciding if a given context-free grammar is ambiguous.
3. Deciding if the language generated by a given context-free grammar is finite. Finiteness
4. Deciding if the language generated by a given context-free grammar is empty. Emptiness

LAST MINUTE NOTES

1. Recursive enumerable languages are closed under intersection.
2. Recursive enumerable languages are not closed under Complementation.
3. Recursive enumerable languages are a countable set, as every recursive enumerable language has a corresponding Turing Machine and set of all Turing Machine is countable.
4. Recursive languages are subset of recursive enumerable languages.

LAST MINUTE NOTES

1. The intersection of two regular languages is always a regular language (by closure property of regular language) is Decidable.
2. Testing infiniteness of regular language is Decidable.
3. There doesn't exist any algorithm to check whether a given context-free language is regular is Undecidable
4. whether two push- down automata accept the same language – Undecidable.
5. whether a given CFG is ambiguous is undecidable.

LAST MINUTE NOTES

1. We have a membership algorithm which decides that whether a given string is generated by a given context-free grammar. Decidable
2. The problems, whether the language generated by a given context-free grammar is empty. Decidable
3. The language generated by a given context-free grammar is finite are decidable.

✓ Regular lang → Decidable for all. (Regular Student Exam clear hoga)

✓ RE " → Undecidable " (Enumerable = Enemy) Opposite of Regular

✓ CFL → Decidable (M E F)
Membership = $\omega \in L$
Emptiness = $L = \phi$
Finite = L = finite

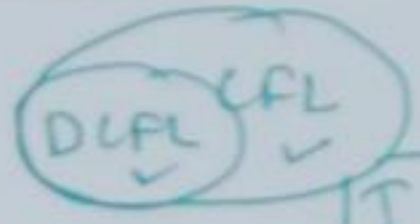
Trick → Maf kar dena CFL BULB Not available
मेरे रहते Exam नहीं होगा।

COMBINECS

✓ CSL = Recursive → Membership & Complement & Intersection
Sensitive → Decidable tariff. karenge

Trick → Family ka member h, bahut dino ke bad aap chhor gaye to Complement mila.

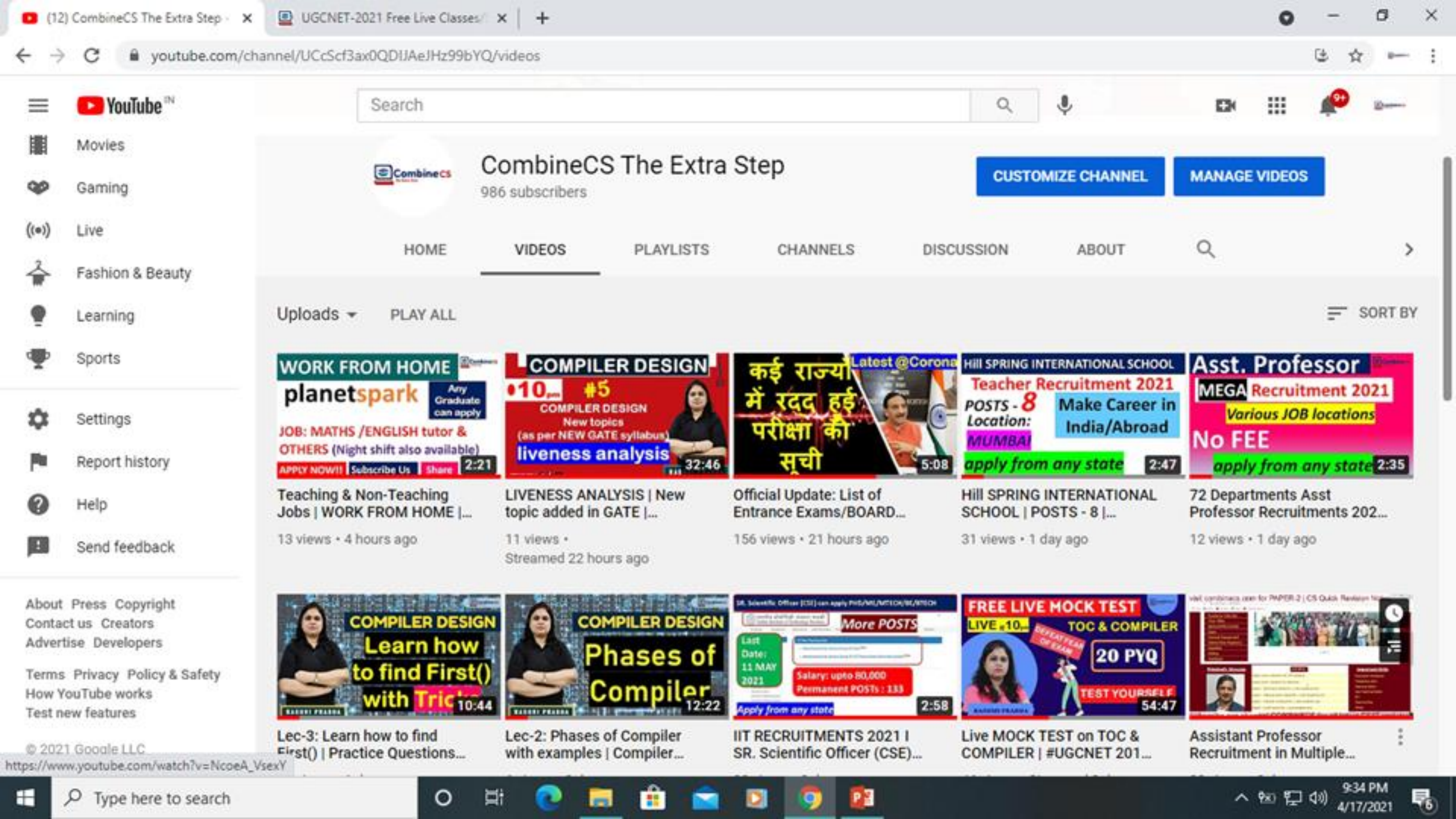
DCFL (Undecidable) → Equivalence, Ambiguity
always Undecidable
$L1 = L2$
Sabke liye Undecidable except Reg.



IASE...

✓ Intersection, Subset

	RL	CFL	DCFL	CSL	Rec	RE
Union	Yes	Yes	No	Yes	Yes	Yes
Intersection	Yes	No	No	Yes	Yes	Yes
Set Difference	Yes	No	No	Yes	Yes	No
Complementation	Yes	No	Yes	Yes	Yes	No
Intersection with RL	Yes	Yes	Yes	Yes	Yes	Yes
Concatenation	Yes	Yes	No	Yes	Yes	Yes
Kleen Closure	Yes	Yes	No	Yes	Yes	Yes
Kleen Plus	Yes	Yes	No	Yes	Yes	Yes
Reversal	Yes	Yes	No	Yes	Yes	Yes
Homomorphism	Yes	Yes	No	No	No	Yes
e-free Homomorphism	Yes	Yes	No	Yes	Yes	Yes
Inverse Homomorphism	Yes	Yes	Yes	Yes	Yes	Yes
Substitution	Yes	Yes	No	No	No	Yes
e-free Substitution	Yes	Yes	No	Yes	Yes	Yes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