CS & IT ENGINEERING

Theory of Computation

Undecidability

DPP 01 Discussion Notes

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01 Question

02 Discussion

Q.1

1. Consider the following statements?

S_1: For any problem if TM exist then problem may be decidable.

S_2: For any problem if TM not exit then problem may be decidable.

Which of the following is correct?

[MCQ]

A. S_1 only

B. S_2 Only

C. Both S_1 and S_2

D. None of these

P ⊏ TM ✓

⇒ Dec ?

P ⊏ ~~TM~~

→ not RE

Q.2

Which of the following is / are true about CYK algorithm?

(Membership)

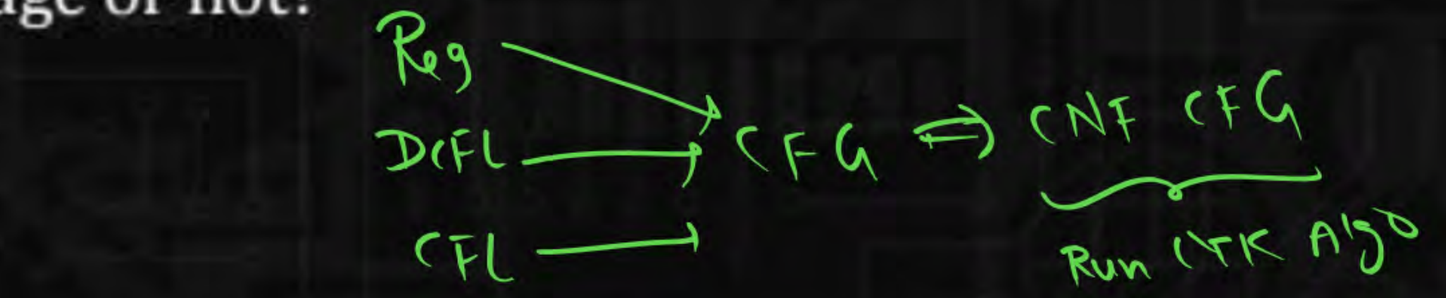
[MCQ] MSQ

A. CYK is a bottom up parsing algorithm

B. CYK algorithm will take $O(n^3)$ time to verify n – length string.

C. CYK is a dynamic programing algorithm.

D. CYK algorithm is used to whether given string is a member of the language or not?



Q.3

In which of the following machine, halting problem is not decidable?

[MCQ]

A. Finite automata. ⇒ D

B. Linear bound automata. ⇒ D

C. Deterministic push down automata. ⇒ D

D. None of these

Q.4 [MCQ]

Consider the following Statements:

(i) Non – disjointness problem is decidable for regular ~~expression~~ (language).

(ii) Totality problem for DPDA is decidable.

(iii) Every decidable (Recursive) problem is also semidecidable (RE).

Which of the following is correct?

A. (ii) and (iii) only.

B. (i) and (ii) only.

C. (iii) only.

D. All are correct.

Q.5

Which of the following is decidable to turing machine? [MCQ]

A. Halting problem.

B. Blank tape halting problem.

C. membership problem.

D. None of these.

Q.6

Consider the following statement:

S_1: In turing machine every final state is dead.

S_2: In turing machine every non – final state may be dead.

Which of the following is correct? [MSQ]

A. S_1 only

B. S_2 Only

C. Both S_1 and S_2

D. None of these

Q.7 Which of the following is not correct? [MCQ]

A. Every semidecidable language is RE. TRUE

B. If language is NOT even semidecidable, then it must be NOT RE. TRUE

C. If language is undecidable then it may be RE. TRUE

D. If a language is semidecidable but not decidable then it may be Recursive. False

Q.8 Which of the following is / are correct? **[NAT]**

A. A language 'L' is semidecidable (RE) iff there exist a turing machine which accept 'L'.

B. A language 'L' is decidable iff there exist a turing machine which accept L and which halts $\forall_w \in \Sigma^*$.

C. A language is decidable iff there exist an algorithm. (HTM)

D. None of these.

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THANK YOU GW
SOLDIERS !