CS & IT ENGINEERING

Discussion Notes

Theory of Computation

Undecidability & Decidability III

DPP 03

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01 Question

02 Discussion

Q.1 Which of the following is correct about tuples of Turing machine?

[MCQ]

A. $\Sigma \subseteq \Gamma$

B. $\Sigma = \Gamma$

C. $\Sigma \subseteq \Gamma - \{B/\square\}$

D. $\Sigma = \Gamma - \{B/\square\}$

$\Sigma \subset \Gamma \Rightarrow \Sigma \subseteq \Gamma$

Q.2

Which of the following is/are equivalent to recursive language?

[MSQ]

A. Turing machine decidable language.

B. Acceptable by halting Turing machine.

C. Decidable language.

D. Lexicographically enumerable.

Q.3 Which of the following is undecidable?

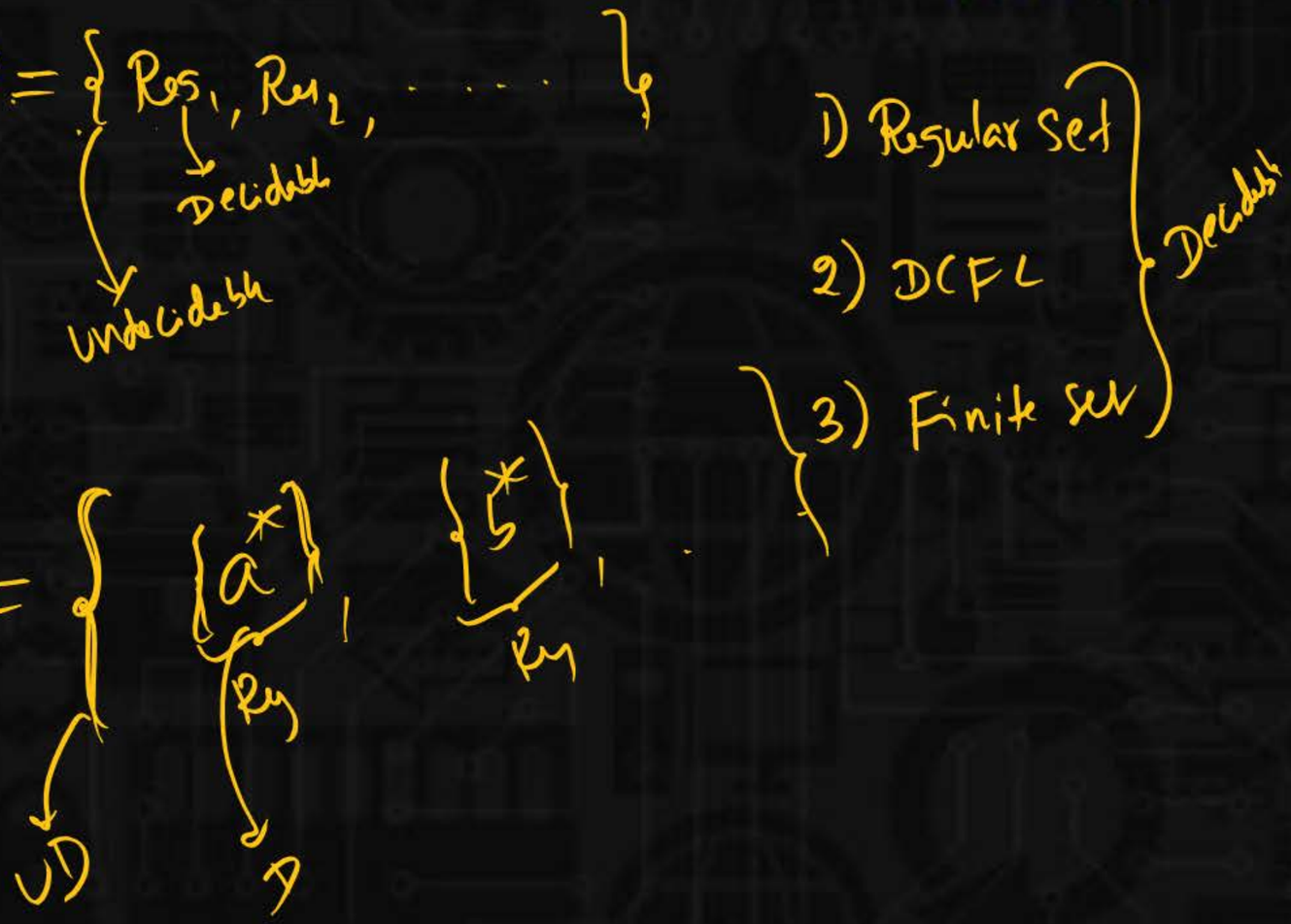
[MCQ]

A. Set of all regular languages

B. Set of DCFL languages

C. Set of finite languages

D. None of these.



Q.4 Consider the following statements:

Total number of incorrect statements are ____. [NAT]

A. Every recursive language is countable. Correct

B. Every recursive enumerable language is countable. Correct

C. There exist a countable set which is not regular. Correct

D. Set of all recursive enumerable languages is countable. Correct

one REL

Q.5 Which of the following is semidecidable but undecidable for recursive language? [MCQ]

RE but not rec

A. Finiteness for recursive languages ⇒ UD (not RE)

B. Totality " ⇒ UD (not RE)

C. Halting " ⇒ Decidable

D. Non-totality " ⇒ UD (RE but not rec)

Is $L(H_{TM}) \neq \Sigma^*$? → Yes Some string not accepted by HTM

Q.6

Suppose, $P \leq Q$ means P is reducible to Q. Which of the following is/are correct?

[MSQ]

A. If P is decidable then Q is decidable.

B. If Q is decidable in $(P)^C$ is decidable.

C. If Q is undecidable then P may be decidable.

D. If P is undecidable then Q is undecidable.

$P \leq Q$

Q.7

Which of the following is incorrect?

[MCQ]

A. Every countable set is semi decidable. Incorrect

B. Every decidable is countable. Correct

C. Set of all DCFLs is countable Correct

D. None of these.


THANK YOU GW
SOLDIERS !