TOC - ASSIGNMENT 5

SASIKUMAR S
220701525
CSE - 'E'

1) Recursive language.

A Language is Recursive language if there exists a turning machine M, such that the turning machine accepts are in language L and rejects those string that are not in language L so if the string w is the L, then M accepts and therefore the time machine halts

- If w is not in the language L, then halts without entering the accepting state
- So any problems or language L is decidable if it is a recursive language
- And any language is undecidable if it is not a recursive language

2) Recursive enumerable language
Recursive language or type - 0 languages are Recursive generated by type - 0 grammars. An RE Languages can be accepted or recognised by turing machine machine which means it will enter into final state for the string of language and may or may not enter into rejecting state for the string which are not part of the language.

It means TM can loop forever for the string which are not part of the language recursive enumerable language are also called as turing recognizable language.

3) Diagonalization language

The diagonalization language, denoted by is the set of the string w, such that w, is not in LCM. This is consist of all the string wi such that by turning machine code wi

In the given table, of turning machine m accept the string in the we first at 1st row and) ith column as the language (LCM, that mean raw represents the string that are member of language we will compliment the binary string along diagonal and of we will this string is 1000 This and there is now 2w 3wm This would contain ϵ.

i ↓	1	2	3	4 ...
1	0	1	1	0
2	1	1	0	0
3	0	0	1	1
4	0	1	0	1
⋮			⋮	

4) Halt problem

The output of TM can be
- Halt the machine will halt state of der a finite number of state
- No halt the machine will never halt state no matter how long it was.

input A turning machine and an input string a problem: Does the turing Machine finish computing of the string

proof. At first we will assume that such a turning exist to solve a problem and this we will contradict itself we will this turning machine 'no' the output comes ~~out~~ 'yes' otherwise as 'no'

input string	→	Halting machine	yes	[halt]
			NO	[No halt]

5) Rice theorem

Theorem

Every non trivial property of recursive enumerable language is undecidable

proff :

property of a language as a set of strings for which that turning machine can be drawn which is ultimately represent as class for example a property of convert all the codes for the turning machine M such that all L(M) are content of language it has the Property ont at least on language and not having the property P - as P is the not terminal there should some language L having property P and therefore there must a content turning Machine accepted language L_1 to L_n and on the is undecidable L_1 is also Turning Machine The time Machine the following thing There exists the not effects m E1 m do not.