

## Assignment III

Dhammjoy Parcel EN 1963 301110

1 Explain the closuse properties of suggestion toggesques? Ans closure propositions on regulare language one defined on contain operations on regular language about one to produce regular language closure refers to some operation on a language resulting in a new barguage that is of some "type" on originally operated on i.e. sieguscos.

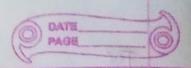
a, Kleen Closume

As in a sugulous expression whose longuages is L.M.O. is a sugulous expression whose longuage is 1.

b) Positive closure

RS is a regular expression whose language is L.M.R. is a regular expression whose language is L.

" Complement The complement of a language I last on outphabet E



such that Et contains 1) is Et -1. Since Et is swely regular, the complement of a regular language is always regular.

Given language L. ALR is the set of streings whose nevertal is in L

e) Union

Zet L P on be the language of regular expression

R & J respectively. Then R+S is a significant expression whose language is (LUM)

Intensection

Let 1 p m be the longuages of regular expression

R & S. respectively then it is a regular expression

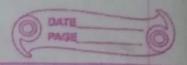
whose language is I intersection m.

g) Set Difference operator

If L P m one signlow capression, then so is

1-m = strings in L but not m.

2 Clarify the chomosky hierarchy, Ans This are divided into fower parts a) Type 0: Unkerbikted Grammey Grammer production in the form of (U+T) ~ (U+T) where , v= yourable , T = Terminals In type o there must be at least one variable on left side of production for ex-Sab -> ba A ->>S Here, vouvables aux S,A & Terminals one a, b 11 Tage 51 Peaglos Grammes 3) Type 1: content Sensitive Grammen Charlette to make total brook there I first of all, Type I Grammer should be Type . ? Grommen production in the form of 11 == 11 i.e. count of symbol in is less than or equal to For Ex - S→ AB



AB - abc 8 → 6.

e) Type 2: Conteat free Grammon

& first of oil, it should be Type !

& Left hand-side of production can have only one variable

11-1

There is no restriction

for &1 - S -> AB

A -> a

B -> 6

FINAL A TAME NAMED WILL d) Type 8: Regular Grammon

This is most restaided form of grammer.

N -> VT/T (left-regular grammer)

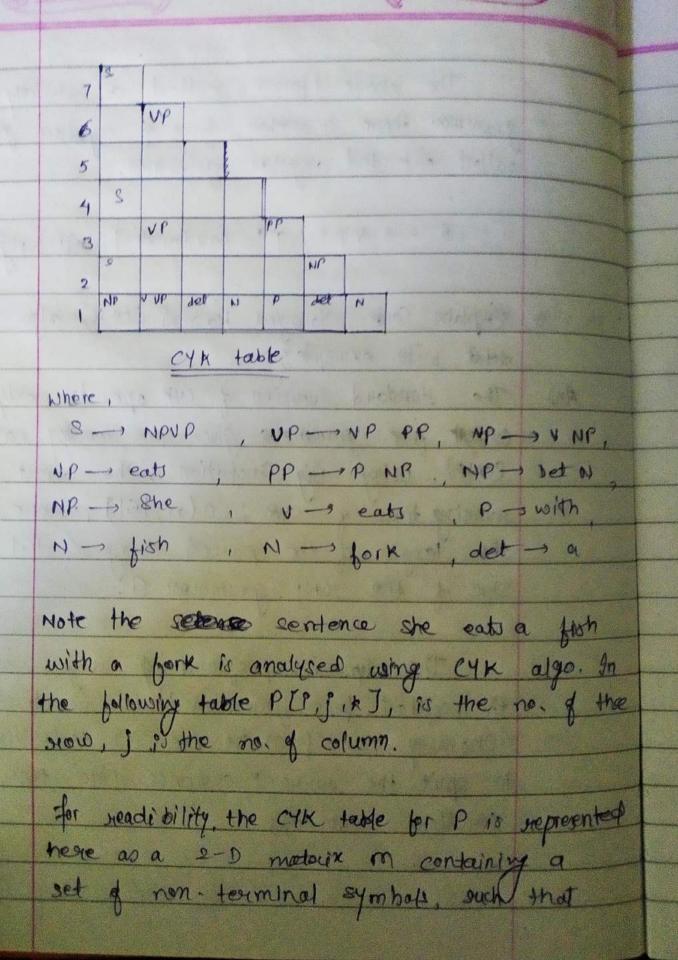
V -> TNIT Coight - siegulau grammere)

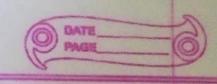
For Ea - S->a

The above form is called as stockly regular grammen those is another form of regular grammen called extended regular grammer. N -> NT \* / T\* (extended left -reg. grommer) 3 Enplain Cock- Youngea - Kasami (CYK) algo. in detail with example? And The Handaud vousion of CYK operates only on content free grammeus given in chomsty normal form (CNF). Using Big Onotations, the whost case Hunning time of cyk is o (n3/91), where n is the length of the poured string o IGI is the Size of the enf grammed q The dynamic programming alog orequires the context free grammen to be rendered into

to split the current sequence into two

smaller seguences.





Rx is in M[P,j] if, and only if, P[i,j,k]. In the above example, since a start symbol S is in M[7,17, the sentence can be generated by the grammer.