## TOC Test-3

Name: Zishnerdu Sarker Poll: 2k19/w/450 =

Answer to the gues. no: 2

chomsky hierarchy represents the class of languages that are accepted by the different machine. According to chomsky hierarchy, grammer is divided into 4 types.

O Type O known as unrestricted grammar

2) Type 1 known as Context sensitive grammer

3 Type 2 known as Context Free grammes

9 Type 3 known as Regular grammer

Sensitive men Type 0

x Sensitive men Type 0

x Context on Type 1

Since Regular 3

gnammer 3

Type 3

There is a hierarchy. Therefore every language of type 3 is also a of type 2, 1, 0. Similarly every language of type 2 is also type 1, 0, and rost are like this sequence.

Type O grammer:

Type O gnammers generate recursively enumurable languages. The productions have no restrictions. They are any phase structure gnammer including all formal gnammers. They generate the language that are recognised by a turing machine. The production can be in the form of d-B where of is a string of terminals and non terminals with at least one non-terminal and d can not be null. B is a

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13	String of tenminals and non-tenm	insale
	Ex J -> ACaB	C/1005.
No.	Bc -> acB	12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	$CB \rightarrow DB$	1: 4. 1
<u> </u>	$aD \rightarrow bb$	
Sept.	1 0	_
3	ype-1 Grammar:	The sales
<u> </u>	11 1 1 1	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
3	It generates context sensitive large	ugges. The production
37	must be in the form of	O. T. C.
25	where AEN (non-tenminal)	
30	and & B, y E (TUN)* (String of ten	minals and non-
3	tenminals)	
- The state of the	The string of and B may be empty,	but y must be
7)	mon-empty. The rule 5 > E allowed	if 3 does not on
	the right side of any rule.	<u></u>
3)	Ex. AB -> Ab Be	A Property of the Control of the Con
3)	$A \rightarrow bcA$ $b \rightarrow b$	
20		A STATE OF THE STA
<u> </u>	Tuo 1 = 9 C= 1000 = 001 :	
	Type-2 Grammas:	
	It remerates context for grammas	languages. The
	productions must be in from A -> Y	. 9 9
man show to	It generates confext free grammar productions must be in form $A \rightarrow Y$ where $A \in N$ (non-tenminal) and $Y \in (TUN)^*$ (String of te	A Charles
	and YE (TUN) & (String of te	minals and non-
	Leng	minals)
(1)		
1	he language generates by these gramma a non-deterministic pushdown Auto	ners are be necognised
by	a non-deterministic pushdoen Auto	omata
A		Secol
	Ch de	William W. Gr. Name

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Ex. 5 -> Xa	
$Ex. 5 \rightarrow 1a$	And the second second
$\gamma \rightarrow \alpha X$	
$X \rightarrow abc$	The lates
$\chi \rightarrow \epsilon$	(1) = 1
Type-3 Gnorman:	
It promonates regular la	nguages. It must have a  the loft-hand side consisting  of ley a single non-tenminal.  e in the form X-> a on X-> a.
ingle non-tenminal or	the loft-hand side consisting
At a single tenning of follow	opt by a single non-tenminal.
The moderation might be	e in the form X-> a on X->a.
where X, TEN (Non-tenn	rinals)
and of thereins	1
The rule 5 > E does not	appear on the side of any rule.
Ex.	District the second
$\chi \to \epsilon$	
X-salay	
$\gamma \rightarrow b$ .	4.73 - 4.73 - 1.
Answer to the gues. no:	3
0	
A Luring machine	infinite length tape divided t is given . It consists of
which consists of an.	infinite length tape divided
into cells on which inpu	t is given . It consists of
0 1 0 1 1 1	1 . V I took II . A all to

a head which reads the inped tope tape. A state register stones the state of the furing machine. After reading an input symbol, it is replaced by another symbol. It's internal state is changed.

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and it moves from or	e call do the night are late
of the M reaches the lin	al delate all insuft stores.
is accepted, otherwise,	ser rejector.
	e cell to the night or left al. state, the input string
A furing machine can	be formally described to as
X-tuples	be formally described to as
(B, x, E, S, go, B, F)	) <b>A</b>
where,	
&= is a fini	lesel of States Alphabet Shabet ition; 5: 8xx-> 9xxxs
X = the tape	Alphabet
Z = i'nput Al	shabet
3 = the trans	ition; 5:8xx-> gxxxs
n ganta	With the shift
fo = initial state	e- America of the miles
B= the black	symbol
F = the set o	L'infinite state.
For a turing machine, the	time complexity refers to the
measure of the number of	of times the tape moves when
the machine is initializ	es of some input symbol
and the space complex	ity is the number of cells
of the tape- written.	time complexity refers to the fines the tape moves when es of some input symbol ify is the number of cells

Time complexity all nasonable-function: 
T(n) = 0 (n logn)

Space complexity
3(n) = 0(

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Ex.				
Fon TM	Prasant State	Present State	Prosent State	
S = { 90, 4, 92, 9n}	to	et,	The state of the	
	1 Rg,	11 40	1Lq4	
$\lambda = \{a,b\}$	110			
Z= 213 g= 2903	1 L Rg2	1Rq	1892	
a = block bizzet				
B = black Symbol  F = { & F}				
		i i	A	
		_	A	
「ペン・ライーマック・ボ 1 mmご		1	2	
data de la composición del composición de la com		T I		
Answer to the gues no:	Zer d'amy	<u>,                                      </u>		
There is the guestino.	<del>9</del>	\-\		
@ The variations of tun	iona manalin	200 01 /	Unix	
The variations of turing machine are as follows:-				
D. Turing machine with.	two-sided in	plinite too	08 !	
D. Turing machine with two-sided infinite topes:				
The first variale	le ave conside	r is that	of 5	
The first variale having a turing mas	chine with a do	spe that i	& infinite	
on both sides.	in the same	18 Wei - 12		
MMM . I		~		
ADD a a b a b b caca DDD				
Read-write head			<del></del>	
rand-whaterand	V	2		
Double- Side 1 into it	to tone one	h	0011	
Aurice making with	a single b	express	any -to	
transforme the Loss this ities the infinite				
Souble- Sided infinite taps can a express any turing machine with a single-tape side infinite tape by leaving the Im definition unattered and simply not using the negative index side				
The state of the s	J. M. Megania	17 000 0	wide 6	
Spiral		al	3 Spin	

10/	Date
W	of the tape
Di	
Si	(1) Turing machine with K- work-tapes:-
9	V
DE	Considering TMs are fixed, but aritary pur arbitary number K of tapes, these variable also have K & independent heads and typically one tape as input / subject tape and use the remaining K-I tapes as a scratch pad to
16	arkitary number K of tapes, these variable also
27	have K & independent heads and typically one
2	take as input output take and use the
3	remaining K-1 fapes as a scratch pad to
3	110 (N) 100 AND
3	computation that are related to the input and
3	output Functions.
S	3K: 8x 5 x > 18U 2943 (EU] L, R})
3:	11.912 7 90 2 413 ( 2 3)
79	
3	(11) Mon-defenministic turing machine: (NDTM)
N. C.	
5	NOTM are normal turing machines with the the only difference locing that the transition function may give us a number of possibilities that we can chose for next stop to a take.
3	only difference locing that the transition function
3	may give us a number of possibilities that we
91	can chose for next step to a take.
126	
kir	5: BX = → P((BU 3 9H)) x (EU {L,R}))).
	Maio The state of the variation of the standard
	Model of TM:
	-> stay-option
	Model of TM:.  → stay-option  → semi-Trifinite
	-> DFF-lima
i i	-> MILITAR L
	→ OFF- Line → Multidimentional → Non-deterministic.
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## TOC Test-3

Answer to the quos no: 1

Multitape: - multi-tape to a constructed with a multiple tapes where each is designed with a unique head. Hore, each head immedependently with other hoads while at the starting input is noted on tape I and others are noted empty. Initially the first tape includes san input and other tapes are remained empty.

Offline multiple Turing Machine: -

input tape is read only. An offline I'm can simulate any to day using one more tape than tom. A tom with several tapes is said to be multiple tom. In a multiple tom; each step is controlled its own independent not read/write head.