Turing Machine: of Turing Machine. - Taught 4.1.1. Notation of Turing Machine! Turing machine is a Quintuple - 5- typhe (Q, E, 8, 20, H) Where, & is finite set of states is alphabet set confaining blank symbol 11/# and les end symbol, D. i.e. it so is set of input alphabet, E = E. U & L/# > DI 90=5 is initial state. HEQ is the halting 8: (Q-H) XZ -> QX (EU (+,+)) is fronsition function such that ∀9 € (Q-H), δ(9, D) =(P, b) then ∀2 € (Q-H), δ (q,a) = (p, b) then b≠ This when turing machine is in state 2 eno scan's &, it enters the state p' an either writes bif bEE anned with Camsomore's left 16 6

TM-2 8-101-101-10		TM-3
or moves right if b = ->	150	Scan head backles M.
O South of Carifel	-	to start with the left and ymbol (b) and nave and it
Machine stops Computation after reaching	-	lo sport with the left and ymbol (b) and noves and with a blank- unless the blank is currently scanned.
Madine etops Compupation after reaching  The holting state, he H  The holting state, he H  The holting state, he H  The holting state and regulation on left and agribor.	#	Configuration of TM (more trelation)
gt always moves of regulation on left and		X
cymbol.		For TM T = (B, S, 8, 90, H)
Tetris : Autobox of Turing Machine		and is configurations , (9), care
The Table of adding wind		(a, 2 cu),
Configuration - Fort Mt of sides and have the		(21, w, a, u,) Tm (92, w2 92 42)
Configuration topics TM, 2 2 2 200111  Configuration topics TM, 2 2 20011 12 12 12 12 12 12 12 12 12 12 12 12 1		
Configuration of the Production of the second		it and only if, for some b & & USA, -}
TI= (Q, 2, 5) 8, H) is the		( 2, a) = (2, b) and
member of 10x D =* x ( =* ( = - { L1/4}) U }e	3	(5-,,01) (0)
1 1 3 31 8 61 1		either b = E, w = w2, u = u2, 42=6
Brandle. Jaka dal 2.		or, 6 = 4, w = w2 92 and
The state of the s		either uz = qu if a, ##, u, #e
Configuration  (a, Da, ab)  (a) A, aab)  (a) A, aab)  (b) A a ab b a a b the first second sec		either $u_2 = q_1 u_1$ if $a_1 = \#_1 u_1 \neq e$
Configulation and 21 Can head		
(q, pa, ab) * q (read write)		0, 6= -> 1, w2 = wa, and
1 50 (2, A) a ab X > = 42 11-3); 5	-	either u1 = azur
This meand, the machine marking		or, u1= u2= e= #/
at there 2 and the seen head is at the	-	
defret impile symbol caring all and	-	tx is reflexive fransitive closure of
This can also represented in anoshes		To so that configuration c, yields Cz
(2, Daab) for simplicity	-	Then .
(2, Dagb) for simplicity	-	C1 + 12
A shere underscore gives the		

	The same of the sa	
7	3 2 7	
TM-4	p1@)	TM-
	-	Austin in Turing Machine of example ( ph
10(1) Consider the Tuning Machine M= (K, E, S, S, 543).	1	it M is efected combo in configuration (20. D 110) then list its all computation in more collation.
K= \$ 90, 91, 43	31.	then list its all Computation in more relation.
e la	1	claim the acceptance.
£ = 20	1	1017- O
and a 5 is given by	4	(diny (20, DUagaa) M (20, DUagaa)
the state of the s		tm (a, DULl aaa)
2, 7 50,00	4	TM (90, DULI a aa)
10 a (91, W)	1	TH (91, DHHHOO)
( in was span in the child)	1	TM (20, DUNH 9a)
201 ▷ (20,→)	4	TM (91, DUWU LIA)
ter to 2 and may ha (assis) boods	4	tm (900 рыппп д)
(a1 3) · in (aq, -)	10	TM (91, AUNUN L)
$A_1 \Rightarrow (a_1, \rightarrow)$		TM (40, DHHNHHI)
केटल ( ता नाप , ना का केट के के कि		TM (h. DUNUNUU)
Draw its fransition diagram	1	(m 75)   0   10
5 to 10 to 1	4	- (90, D Цааса) [M + (h, DUHHUHH) Cowif
5 + U + 5 + (D) - (0, a)/a (U, -)		of 10 steps the computation is completed.
Letto WA	1	
(a) (a) (b) -) (a)	4	185 c - 1 · 1 · 1 · 1 · 1 · 1 · 1 · 1 · 1 · 1
(iju) o u sahis		- 1 ( 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
L/# 2 - 10 - 10 -00		
	1	
to secure a situation (s) expendent it.		
a blow or with more than on it		5 (C. 1.6)
CE Commadituith ComeConnes	1	
3 Scanned With Campcarine	4	
		The state of the s

Tra (	
TM-6 Pb (6) Davien	<u>A</u> /D,→
Pb (6) Davign a Turing machine. What changed non-blank symbols into blank (i.e. aux as en exases) over an alphabet = 5 a; W, D).  Hence, Test your design for DWaaW	Q^/(v,→) · TM-7
on eraser) and blank (i.e. aver as	(90) a/(11, N)
Hence, Test you al Mabet E = { a, W, D?	Why afan)
June danger for Dulgan	
Con: Liet Man (K, E, S, C, A) be required	□/(□, →) ·
( Luning marking.	(h)
( ) ( ) Where, K = { 90, 9, 4}	
S 2 2 9 11 N 2	Now, Chesking this
( 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1	Now, chesking this design for given inputs
Continues of H= 8 pt	
(PERMINE) (SE) (A)	90, D. LIQO W M (91), LILLOU)
Land the transition function of is as follows.	TM (900 DHHQU)
[[ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [ [	
Mula 24 10 10 10 10 10 10 10 10 10 10 10 10 10	М (4, риппп)
90 a (91 W)	M (do > PHUNH)
week (2011 HUMA 1) (h) Whom I do to)	
20 Doton (90 00) mit. of in	TM (h, DUHUL) /w
	Very like another moterion # inspead of W.
	The design be,
2, ∐ (9,;→)	Let M = (K, 5, 5, 5, 5,3) where,
21 1 (91,-)	K= {900 90 h2
	K= {900, 90, h2
	S = %
The francition diagram be:	and & is given by
	1 U
Scanned With CamScan	ner and draws as as
	" At of Carrie 19 6 20 1 30 30 1/2 50 321 .

	TM-8				
	-				try.
	9	~	5 (2,0)		H= { 24 }
	20	a	(91, 11)		Mark the Control of t
			O Land	1000	Alphabets, & = & a, 6, #, D3
	20	#	(h) ##)		The state of the s
	9	a	(90, 4)	-	2.= \$4,63
	9,	#		- 2	10 1
	21	1 #	1 (00, 8)	-	The state of the s
150	141 0000	do said on		-	The design has
	N600 -	cheusing	for # 9 a # 1		(6,0)
	1	T HO OH	) Im (1, ##a#)		0 0 0 0 0
	(10	J# = ~ ~	- (a + + 4 + )	_	(a) (a) (a) (a) (b)
	(60)	E 141 - 0 - 67	· M (90, ## 4 #)	-	
	1 (1)	12 of 1	IM (9, ###)	_	(#, s)
	1		.tm (9,, ####)	_	(Par)
	1			_	(qu=3h-3
-	0. 71	11111111	TM (h,####)	_	(#,+)
	200	The state of the			(6,2) 1P H= 5943
-	0 0	A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			H A A A A A A A A A A A A A A A A A A A
Pb	(A) Ne	tign - a	Turing Machine TM, that accept	K	The transition functiones S= { ((90, D)(900)),
	[Ke	laquege	e L ≤ ξ ω ∈ (9,6) * ; ω Contains	-	((20,0#) (4,0->)),
	5-28-4	Sulstin	g aab f		1((10)#) (4,5-1)25
	4	Carrent	that the initial configuration	-	((a3,a)(a3;-)), ((a3,
- 1	-	(20)	<u>ν</u> #ω#).		
	L			_	(15) (15) (15)
	oi lei	+ ILE	required Tining: machine be.	200	1 (a)
- 4	5 2	JOHN TE	(C) 5, 0) 20 , H) Hrere,	Д <del>⊕</del> Н——	(3 (5)
1				-	(8 - 8)
	51	er of St	ared, Q = { 90, 91, 92, 93, 84, 95}		(A 45) 14 12

A THE RESIDENCE OF THE PARTY OF		to the metallicity of the second		
				110
TM 10		141		t TM-11
[M-10]  Let ≤0 = ≤1 = {0, 1} and let f: €0 → €4	+ 2)	22 000000	(221. 2)	. 10. Sys
be defined as for any was f(w) = w', Where w' is the exhibit of webplacing each occurrence of b' in w by it and vice versa.  The defined as for any washing the lamputes and schenge machine of which compretes was and schenge and schenge of an action of the schenge of an action of the schenge		22 1	11.6	
12 is the estale of replacing each occurrence		22 1	(22,R)	
of b' in as my i' and vice versa.		22 #	J. (b, #)	.13/
in Design a Taxing machine of which comprises			3	
fand ocheck your design veing the		1 11 - 11-0	0 4	110-4
China 110.	( Coro	tenting the	spring for #	110 # -
			m (21)#110)	
we want to design a Turing machine that takes input as # 110 # then if			Sec. 188 - 188	
suffert would be #001 #.	- 1	ad mariant	1. (20, # 11_1)	
(a)		C. Property	7 (2, #111)	
Ma (K, &, 8, si H) be the required		j.	7 (20, #101)	
turing machine where,				
K= 5 90, 21, 9, h}	1 1		(21,#101)	
2= 50,1, #3		- tm	(20, # 001)	
0 5 0 2		tm	(21, # 001)	
S = 8 90 3 = 90	4 300 1	12 SEE COL	(2 4221)	· · · · · · · · · · · · · · · · · · ·
H = 9. k 3	- 15-14-	- In Control	(22, #001)	3.798
and the of frontifion diagram & is given by			( 22 , #001)	
8 (9,00)	- 1	IM.	( 92, #00±)	in I weigh
(a) to (see (see (see (see		+ tm	(92,#001#)	
40. 1 (a1, L)				T.
20 # (9, L)		IM	(h, # 001#)	
		1 ( X	proved	
bearined, With Carrista	III (d.)			
21 # (22 R)		4		

	Land Control of the c
TM-12	ph & Design a Turing machine for the large
160 Design a Twing machine for the regular	( - 1 m fr n 70}
expression &= aat.	L= (a 6)
	b (4) or for 1/2   L = (a b) r for n 70}  L = (a b) r for n 70}  or for the regular expression. r = (ab) *
let, the Tuning machine TM, i  M=(K, E, J, S, H)	DO TM M= (B, E, S, S, H)
M=(K, E, 0, 5, n)	101- TM M= (B) 2, 0, -1111
Where, 59, 2, 62	H= { h} - 1
K= Sq., 2, 4)	£ = \$a, b, # 3
H= SL3	Q= { a, a, b}
= - Sa, # }	X= ( )
1- 15 transfirm diagram be,	Quite diagram be,
()a/6,L)	Fren, the transfer diagram be, (a/a, L)
S = 10  2 = {a, #}  No. 1/2	Spent (20) (6/6, L) (2)
	37 - 12.
174/(8, h) C result	1 1 1 1 #/(x, h) = 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
(1004.00)	
(6)	(B) 1 W
here half state In Significal as accepted	
here halt state Ih signified as accepting.	Test your lansmer for,
Clate + Test the kesult for 7	# abab # do us
# a a a # J & .	
Now, (20,# aaa#) + 4 20,# aaa #	
( t 100 to 10) 1 1 1 1 2 a #	Note: Y = Yes it is outpled
	W. 6. 7 = 10 17 13 auptea
	<u> </u>
	the state of farmer staylers.
PI Scanned with Camscanner	

TM-14	1 tm-15
B. @ design a Twing machine that recognizes	aiven input #1000 # (#100 #)
We set of all chaines of the be 1's containing	
the set of all strings of 0's & 1's containing at least one 1. Machine should print y' if	(20, # 100 #) M (21, # 100#)
I is found and chould point on' if No	/m (2, ,#100#)
I' is found. Hence, test your eletign	Marie and the state of the stat
for #100#-6	M (21, # 100#)
	m (h, # yoo #)
Soil let M= (K, E, Jis, H) be required	
turing martine where	
1 3 - 3 - 3 - 3	Pb(5) Design a Turing machine that scend to
K= S90, 21, 4 }	light until it tinds two consequitive
2 = 503 13 # 3	ids, be then halts. The alphabet of
	the Turing machine should be &= fa, b, D, L12
S = 20 (4.00) ( ) - 100	Honce, test your design for Duamabaa.
H= {h}	S1/12 / S1
and fransition function & is given by,	sillet M= (K, E, S, S, H) be required
	there, K= { 20, 21, h?
2 0 (80,0)	Where, K= { 90, 21, h}
20 0 - 100 (91, 0)	= {a, b, D, W}
20 1 (21,1)	S = 2 <sub>0</sub>
200 # - (21, 4)	H= {h}
2, 0 (2, L)	and the fransition function & is,
24 1 (h, y)	2. \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
2, # (h, n)	$q_0$ $q_1, \rightarrow q_2$
4 + (.)	20 6 (20, →)
	20 ₩ (20, →)
Consideration of gramith Camsca	
	20 ₩ (20, →)

	The state of the s
TM-16	# Short Hand Notation for Turing Machine: TM-
91 W (20, -+)	A STATE OF THE STA
$a_1 \rightarrow (a_0, \rightarrow)$	For the other hand notation following literals are used
4, ▷ (4,0,3,-)	describe the twing mathine.
100 100 11 10 100 100 100 100 100 100 1	Li, R corresente left to light moves.
for the injust DWaWabaa	a >> Write A.
	> => Starting point
(200, AMa Wabaa) M (40, AWquabaa)	The state of the s
Im (q1, Dwa wabaa)	ar R => move right it you kead "a".
L (20. D Lawa bea)	a R > move light it any other symbols than 'a' is
my (and wallaban)	The state of the s
to there is to said a sent ( the control of	or move left as long as you see it or move left as long as you see sa' and stop it you do not see a'.
M (20, D Wawa 629)	or move left as long as you see sa' and
IM (1, Dilallabaa)	stop it you do not see "a".
	29
ame 1 (Ka & Ty (h, Duanabaa)	L' = La => Keep moving left till you read a? a.
there is a suchine in the second seco	Etop When you read a.
14.4.4.5.5	La ⇒ stop moving left if you see 'a'.
2 - 80	
145 =11	R -> R => for any symbol you read; move right
and his commenter function is it.	= RQ ⇒ P2
1 2 810,00	2 1 × 10 × 1 × 10 × 1
(11, 40)	a## R > Move light it you see any & you be any & you be any & you
(4.2) 3 14.	2 which is not # (blank - symbol)
CS Scanned with CamScan	er
(24) 2 2	refered the control for the first state of
	The second secon

II .	
TM-18	TM-19
Design a Tuing Machine that accepts the language	PO(1) White-down the whort hand Natasim of turing machine
of all springs which confair 'aba' as subgring.	accepting the Language L= & w = (0,6)+ : " is contain
subservator district	accepting the language 1= 5 w & ab + : W w confirms
sof Let the Tuing machine is TM= (Q, E, T, S, g, h)	as the plots. Where, the initial configuration is
Where,	(20, D # W#).
Z= 3 a, 63 / mind	
F = \$9, b. # 7	8.17. The short hand notation following the transition diagram
Q 2 { 90, 21, 92, 43	Tf Pb (4), i.e.
. The initial state 18 = 90	(b, 2) (b, 2) (a, 7)
	(a, -) (a, -) (a) (b, -) (a)
& he halfing state H = {h}.	(b,+) (23) (23)
	(#,+) (B,+) =
Then the fransition diagram be!	(As) (#,+)
(b(b, L) (a/6, L)	G V
	(#,>) (a, +)
Aut (20 3/6, L) (2) 4(6, L) (2) 4(6, L)	(b, >)
	Its shirt hand Natasim be;
6 10 -10 to 6(6,12) cm digit 1 111	tra Mariana signal sida di di sa cara
	b
The transition table forms be	>R#Reakaxbx
a 1 b 1 #	# # #
90 (9, a, L) (90, b, L) -	# \
4 (9,,a,L) (9,,b,L) -	(G
22 (h, a, L) (90, 6, L) (h, # N)	(#, a, b) W
CS Costonad Tuitle Garage	ma della secondi
Scarined With Carrista	IIIE ( ) ( ) A A A A A A A A A A A A A A A A
Where N- not specified move for halfing.	the state of the s
	MANUAL ROLL CO.

	and H1	
TM-20	S(a, a) = Sa(a,	^
Combining Tuing Hackings	9+ 9= (K,-H2), Hen &(2,0) = 51(9,0)	2
-x J -x J -x -x -	01 9 € (K2-H2), Kein 0 (2,0) = 02(2,0	5
Twing machines can be combined in the same	9 26 (Kg-Hz), Hen 5 (2,00) = 52 (2,00)  9 26 (Kg-Hz), Hen 5 (2,00) = 53 (2,00)  9 16 26 (Kg-Hz), Hen 5 (2,00) = 53 (2,00)	~).
malkines can be committed of Anite automobile	37 70 TL QCH1 - The only case rem	mai.
way suggestive of the structure of this sutination of		
rollowing diagram shows the simple	or=b and & (g; or) & H other	
Twing Machines:	N=B	MILO
	A 1 100 1 10 10 10 10 10 10 10 10 10 10 1	-
M <sub>L</sub> a M <sub>2</sub>	f. The Make	_
b 1311	Other special Notations for Turing Machine:	-
(mg) \Mg	-x -x	
94 operates - start in the initial state of Ma;	6	P.
phosphe 2d M. would pherate until MI would	BY BY OF >R SHAP R	
half the if the currently scanned symbol is		
a cas in I M and alexate as Man Would	1 1 De Alexander and	-
an a super 19 some great organized	This diagram indicates,	
operate; otherwise, if the currently reasoned  Lymbol is 16, then inspecte My and operate	The Hotome School and	- 5
Symbol is b, then impacte 1713 and	discours moves its head right one	391
170	il its content is on d'or b	m- 1
let M. = (K1, 5, 81, 21, H1)	then it moves its head one square	R
M2= (K2, E, 82, 82, H2)	1 12 off shore may be written as	1
LM3 = (K3, 5, 63, 53, H3)	Right. The above may be written as.	17.0
	1 131753 VOL. 1	77
Assumy, set of states are disjoint, combined	lo the above machine becomes,	_
pourry, see of spire with these	$RR \rightarrow R^2$	
machine M= (K, E, J, S, H) Where,		
	Oa≠H	
K: K1 U K2 U K3	Granting > R = This indicates, the mo	
. S= S1	8 (II.) > K	acro
H= H2UH3	or runs its tape to the right	
CS H = H2 UH3  RES (2 (F 4), S(90)) E	finds a-blanks.	
is defined as:	a # Li is read "any symbol "a" of	other
s righted as	A DIAM DIAM 18".	

TM-22	TM-23
	ph (13) Design Tuking Markine using the short hand nepation
> R II => Rw, Which finds the first blank	which postoms
Square 1= the kight of the	" Copying machine 'C', which transforms  LINU into WWWW with the alphabat
or Ku Currenply 1 scanned square . 1	MWU into HOWHOH with the alphabet
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Z={a,b, L13."
D > L DII > LID Hhich finds the first blank	- 1 m 1 m 2 m 2 m 2 m 2 m 2 m 2 m 2 m 2 m
on tou square to the left of the comerty	4017-
scanned square.	> Lu -> R - + U R2 ~ L2 ~ L2
Alack of the property of the property of	U U
> R ) H => R , which finds the first mon-blank	The Party of Ru and the set of th
or Ru gause to the light of the	
Currently scanned equase.	operation,
	let w= ab, then the above Turing meetine
1) >4 ) 11 - WI Which finds the first nomblank	Chould perform Nable into Wabliable.
Square to the left of the	Which can be done as
Lity currently scanned square.	Haby West loop  Haby Wab He Habba  LR Hab I Habba
4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Парт Нарна Нарна
I whole near 2 no based 24 arms + in	
Carrie Miller and Cole and Carrie Miller	П ППР Кт ПаппаП
(2) Design the Turng Machine which exercs all	Ви пропр и напнор
the a's in the pape, use short hand notation.	TE HIPH a Harrap
(B)2	TEN TIN PIN & TO PINGP
>k_a_11_	
	то навна
9f sperates as [ for Wag!]	Non-Julia Valua IV.
ICS Scanned with CamScan	Next loop: -   R Wab wab
LU IIII	Ru wabl abl
R WWA	- I Brd

M-24	April 100 100 100 100 100 100 100 100 100 10
	Due short handed method to design
Pb(4.) Sering Right 115	pro use short hardan transforms LINUSLY in shifting machine that transforms LINUSLY in
pb(h) Design Right shifting twing machine that perform UWU into ULINU wing short hand	Chiffing
method.	Con-> Lu >R - Con Lor R
F 10 11 12 34 11 11 11 11 11 11 11 11 11 11 11 11 11	Con >Lu >R Love
800-	Ши 1
L OFLI ROLL	LU '
111	The second secon
-10 Jul Sin RURU TO Security	1 test this design for WHable
	Let us I bear
lat us check this design for Light into	шиаьы шыаь
WW aby.	LE MM 16
Lot who	L MARA
Lab Jo	la Haab
LIGHT OF PRINCE LABOR EN 1940. Symbol so blank LI]	R Wagb
Labb Cu changed la b J	Nox+ loop:
- Lighb	Nox 1000 R Maab
District to the second of the	1L 11aab
THE THE PARTY OF T	Lo Labb
्राच्याचा वर्षे प्राप्त ।	R Wabb
James P. Labb Sign	, v. A 1. A. 0.0.0.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.
Labb in	Next lead !-
12 Waab Hann	18 Habby
-11 4234 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1 1-10 bb
Mext loop IL 11 aab	
IR waab	H Wabel
F Hap	with the specific first weather
CSI Scanned With Cam Scannel	The state of the s
Scanned Wing am Scanner	
w.	(SEE ) ( CONT. O. )

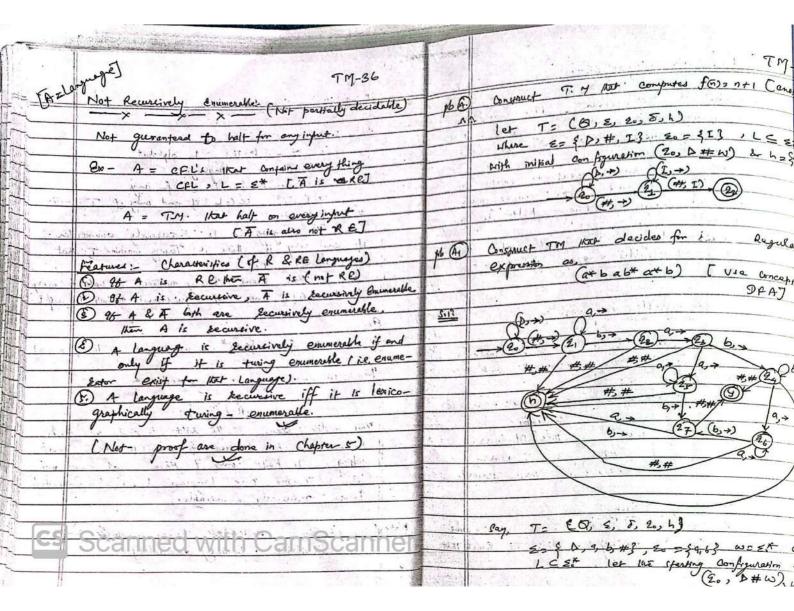
TM-	M-26
	Computing with Twing machine:
Ra a R b dR - c a Lu	
74-746	et M=CK; 5, 8, 5, H) be a turing machines ruch
(Cu) /qu	hat H= & y, n } consists of two distinguished helping
(Bc) V V	cepates (y' and n' for yes and 'No'). Any halving
/(yes) (No) [ earst this]	antiquetion where state component is y' is alled accepting configuration and in' is
	ejected one. We say liket M accepts an
lat us cheek this design for Wabc	Jut w∈ (=-{U, N})* If (5, DUN) yields
A CONTRACT A STATE OF THE STATE	accepting Configuration and M rejects
Labo Labo Next loop	accepting Configuration and M rejects If (S, NHW) yields a rejecting
d udbc R uddd	Configuration.
	The turing marking decides the language Life
d Hade Budde	when started with injust co, it always halts and
IR wade IR waddu	Loca So in a half state that is the correct
d wada 14 waddy Accepte	sesponce to the input; 'y'(ye) if well, n(No)
Lu Edd d	if wFL. No guaranteed are given if infinite are plant, and left end symbols.
Again, let us cheek, for Waabc	4.70 41
Nor last	Net delana at
Laabe Mugabe Ludadd	Design a Turing machine that pecognizes the
1ª Wdabc 15 udad	Language given by L = Sambinch: n > 0} with
La magad	The alphabet > = 2 a, b, C, 11 3
To made To maded	
	1- Let us infraduce a new symbol d'in
d Udedd	the alphabet which help us lo prepara an bro
The Hoperate Transaction of the	then the Til her is short-broken mile
4	to get L= { an6" c" : 470} be:

TM-28	Γ#→ offee
16	G-9 is initial chate Symbol
(6) Construct a turing machine that Computed the	- 20 II (rajisi sja
following function.	H={h} is halting state.
f(n,m) = n+m	and & is defined by fillowing transition dragea
Soil lat I represents 1, #II# represent & and	(#,L) d(I,e
	(2) #/(#, w), (2) 1/(d, w) (2) 1/(d, w) (2)
so on . We assume that injust numbers (that is	(1) #/(#, L) (2) 1/(d, L) 1/(d, R) (2)
n and m) are written on the trape separately	7
# - That is if we nort to add I and B	
Ne injust spring will be # II # III #.	ine (24, N) → (h)
Which gived number as Allower	Note that the state of the stat
which gives output as follows:	The state of the s
the state of the s	In the above turing machine we are not s
#2I#FII#   #UIII#	the moves from every state and those more
When we analyse the output them it becomes clo	nas input symbols are considered as path (transi
that for consprueting twing machine for	available for some inputs and machine reject
f(n, m) = n+m, we have to semove #, which	
separates no be m.	Water State Control of the Control o
Infact, possibling turing machine	Check: 2+2= 4 [ # II# II#]
Norks as a left - shift machine (say SL). It sh	# II # 2.  - # TI # I 9. I
the each symbol of m portion of input by on	+ # II# 20II
Cell towards left.	- # JI # 2LIT
Pot turing machine is	- #1I#I9 <sub>1</sub> II
let furing machine ic  Tim = (Q, E, O, S, 90, h)	├ # 11 # 2,dI
M = (0, 2, 9, 9, 4, h)	# 11 I de3 I
Q = (20, 21, 92, 93, 24, h)	+ # 11111 £
£= \$ T ]	- # 15112 <sub>2</sub> d
Γ= 3 I,#3 = ε*	→ # 1111de3
1=7-1,45-60	- IIIII 24# - # IIII

TM-30	1	TM
(7.) Degian a Til	V	
Phone that the	(12.)	design a luing machine which computes
hat the following function is turns		Design a Tung machine which computes ; function for south: w & \( \) \(
Prove that the following function is turing Computable.		
for the contract of the second	J.1?-	Let the input 15 # 26 # Ken Ton should give
f(n) = \ n-1 \ n > 0		as #abba# 1 ( A ( ) A ( )
Chelle Constant		
Comment Comments		a/20 1/20 #/01) (#/11)
exist a tuning machine the it is favorille		( H/H, K) (4)
exist a puine could freeing ampulable their their		· HOUNT
me have les of machine for it so barrelly		Co . The
		14(5)
of (a) . This tuing machine should give output  # # # (n=0) and # II # for # 111 # (n=3)	9.	(a) A(a, ), e/(b, L)
# # ( n=0) and # II# Ar # 111 # (no3)	1 17	(74)
let the in their religions principle proper and the		#/(#, N)
machine to		
Tm = (G, 2, 6, 20, h)	- 11	proces for # 96 % # 40 # 42 # 22 w
C 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		+ #absb + + aba# 24
1 1 2 2 3# T.1		[ Till ) > + # 2966 + # a66a#h.
To it initial state and his halfer that		
relation of its defined by Allowing		1 + 4 4 b2, b
transition diagram is 1 1 1 1 1 1		F# Abb#2;
(T) #(#JA)		F # 466232
-(E)		F 4 623 62
1- + 11 m		F# 402362
#(#.8)		F# 42366a
		1# 10 abba
let us process the following Horng: W= # IIII #	7 1	- H 40 4664
		T# 26246a
# LILL 20 1 #ITI # h	lead to the	14 266242
For Ming # 20# 1- ##h	140	F 4-16-0
JCC Company Title Com Comment	1	W 14 Fabracy

TM-32	Recuesive function:
(B) Design a Turing machine for the following language.	let M= (K, E, E, S, S, {h}) be a tring ,
L - 60 for n > 263	let EOCE-9 U.D. be an alphabet and
	WE EX. Suppose that M halfs on injust as
Las de la truta de la	(S) DUW) H*(h, DUY) for some y C Ex
THE (0, 5, 8, 20, H)	y is called the output of M on injune
Where Q = {20, 4, 20, 4}	y is called the output of M on injunce and is denoted by M(w). Notice was 1s defined only if M holfs on injust wan
5 2 fa, bj	Is defined only if M halfs on input wan
≤ , = { a, b, #}	fact does so at a configuration of the form
VI VI	(h, D Ly) with y E = x.
S= 20 initial state, H= [h] halting state	Et to Et . We say that of computer of
( ) a/(e, t) (b/(b, x)	IN WE Est., M(W) = f(w). i.e. for all
(1) (1) (2) 4/(to, 1) (2) (4, 1) (2)	M eventually holfs on infinit wo and wh
	does half, its take confaine the spring
#/(#4)	Hence, A function of is called recur
(#/XN) distribut	if there is an twing machine M that com
	function f.
	<u> </u>
processing of w= #ab#	De Bo Design a Turing machine that computes the
#2620 - #22,#	successor function success = n+1 coith alpha
# 210#	E= ggs, Lig. Heria test your design for W11 Lto W100 L.
F#12#	MILE 200 201
F###4s	Sill we can design the following trining machine
J- ## % #	Computes successor function.
L#Yh#	
Scanned With Camscanne	Rul
August 14	L STRU
to the short.	> 15e

				71
- 44		Kecwisively	Enumerable Language	(C) TM-35
M-34 Where SR is light shifting ma	cline given by			<u> </u>
Whene SR is toght		let T = (	Q, E, S, 20, H)	
Nice -		500	Z - { D, #} be alyher  Seni-devider L if for	7
>Li attu Rah		1.5	= 7 1, FFS he alpha	bet
> L		(Pa) =	So be a language.	
W I I I I I I I I I I I I I I I I I I I		1.00	Seni- devider L. if for	any
RURI			and it and	only if 'T' halfx
THAT IT I THE	20 × 10 × 11			
This machine first finds right	end of the input	→ 'A	Languag L 1s secursi	rely enumerable
This mass lo the left as lo	ing as it seed 15	if and	Languag L is secursismly if there is Turing	machine T Ital
and the sis lo o's	Y When if sees a	Semi- deci	It's it!	1, 1, 2,
This machine first finds right and then goes to the left as to changing all of it's to o's changing all of it's to o's	1' and halts . 96	(47 gay	This means turing maching L brush Not gurantes	7. 1.11 0
10' git anachine	writes I in place	infut w	-L but Not	half for every
		1,100	guantes	d to half for wetl.
of Li and Jobs		ex.	A STATE OF S	
exter and halfr.	tarigin for given injust	(A) 1.4 1.	2 - 2 (	- 19.1
ICO COM THE TOUR	1001/1	O tal L's	{ w ∈ {a, b } * : w Conjain	s at least one al
н 11 Ш аз:		er, w		plus -
W114 100 11111		Then, we co	- design a twing machine	for Lass
1- M11M	- A (m) A	2.31		1 2 1 4 1
HOIH OF HIOH	1 1 1 1 1 1		>R) a	19
· LEGHTON.		This machine	scens to the eight to	and one aust
10 1 MOON .	Control of the Contro	no a is of	rund, it goes for over (in	Laite hoad marme
11 21001		halfing . 9	t halfs only it there is efter given language L	at least
		'a' . The	etre given language	is my dill
1 ± 00 ₩	are in the day	henes no	currively enumerable.	15 sem- decided
13K 110011 .			J enemals	
		Loter So, 20	· · · · · · · · · · · · · · · · · · ·	10 C
		are are	. Undecidable, twing-ac	ceptable, semi-
11.0		decid	the partially decidable	
		No. 1		
CS Scannedw	ith Campa	5. Ly		
THE STREET STREET				



7M-38	
* By Recurive Language:	TM-39
X DX	- 96 WEL, Menters 2accept
A language is secursive if there exist a	of w & L , 4 enters 2 reject.
tuning machine that accepts every string of the	Hence
Language and Esjects every springs that are	+ Secretes - always terminates
not in the language.	* Reignized - Can Run forever , then its is without deciding
- so, we are sure about the registring	- Camy
springs which are not in the given language	Theorem: "It a language is recursive , then it
-> Recursive language always halfs the Turing	is knownsively enumerable".
	Jan 11 Jan 12 Ja
prively enumerable language RC RE.	phof:
to bear the house the second	A language is becurively enumerable if
1018	there exists a tuning machine that accepts every
* Turing secognizable Language!	springs of the language and a language is
	Recursive if there is a furing machine that
A language Lie turing recognizable	not accept a strings that are not in the language
if here exists a turing machine M such that	
for all springs w:	Sh, every recursive language is also
2 accept	securinly enumerable. Home the given expansion
→ # wfl > either M enters	is true. We can observe this cancept
2 reject or M never	with fillowing diagram.
terminates ( infinite looping).	RE
7 (1:0 1.14)	(Recursive)
* I wing decidable Language.  To inneare the sound which is a truing machine My Cuch that	A Hence proved
- State of the control of the contro	E
for all springs w:	of the first