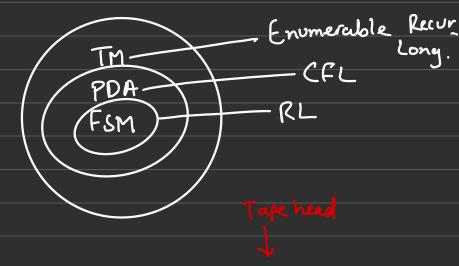
#### TURING MACHINE



Tape Alphabets 
$$\angle = \{a,b,0,1,x,y,z_0\}$$

### OPERATIONS:

- Read/Scan symbol below tape head.
  Write/update symbol below tape head.
- · Move tape head one step right. · Move tape head one step left.

## 7-TUPLES

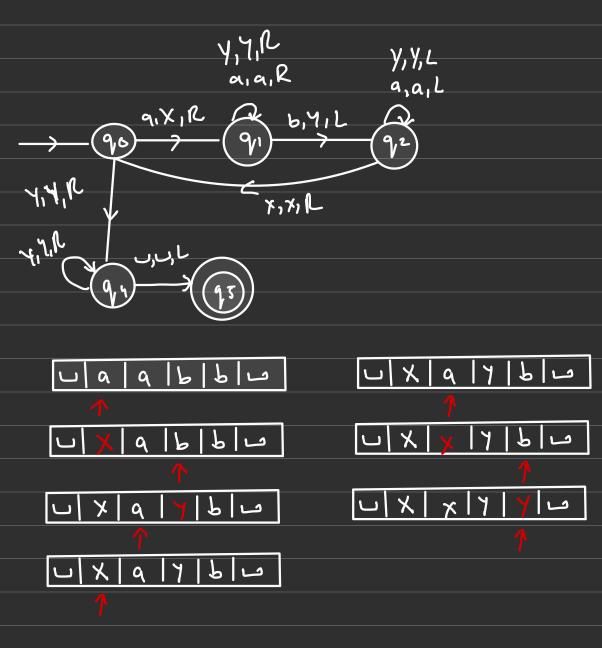
 $\delta$  = Transition function [ = tape symbols F = final states

B = Blank symbol 900 Initial state

TRANSITION: -> QX \ x ( Left/Right/static) 8 = Qx[ > (q,,z,L) (9, a) > Func. computation 2+4 2-4 21x4 2,2,1 a, a, L Y, Y, L 4, 4, R 9, a, R 2, 2, R b,b,L b, b, R b, Y, R (92) ----×, x, R L,U,L/R

Made with Goodnotes

Q#2 A= { a b | n > 1}



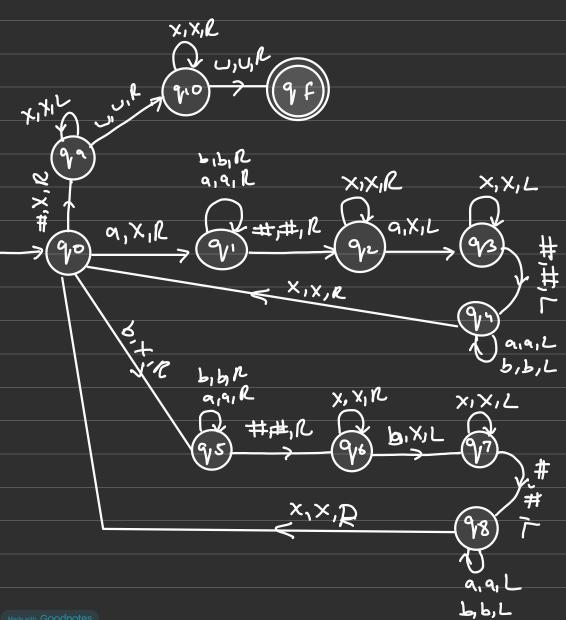
Made with Goodnotes

A= { WW | WE {a,b} } J.U. R ا،ں،ل 17,R <del>ں,ں, ا</del> トルル ا, L, L 9,9,R a, 9, L Ya, U, L س, ب مرم, ل  $U_1U_1$ 6,6,6 b, L, L 9,9,R b, b,R اربرك

Made with Goodnotes

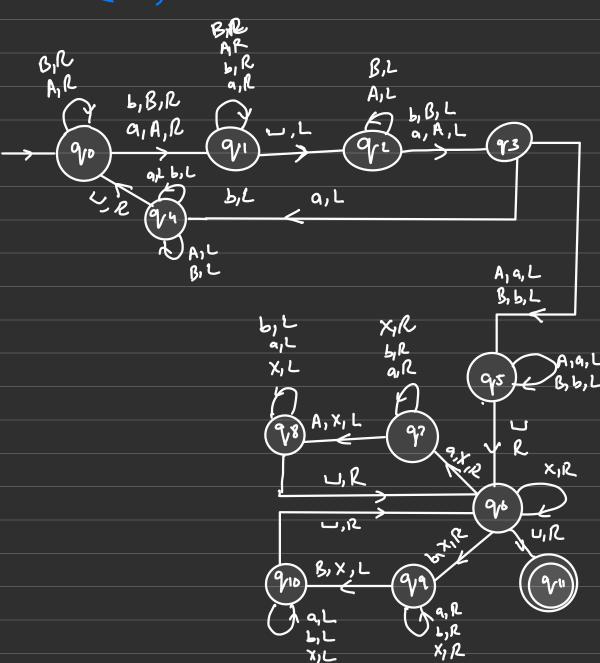
W & { a,b} ? W#W

ulalb#lalb u



W E {a, b?

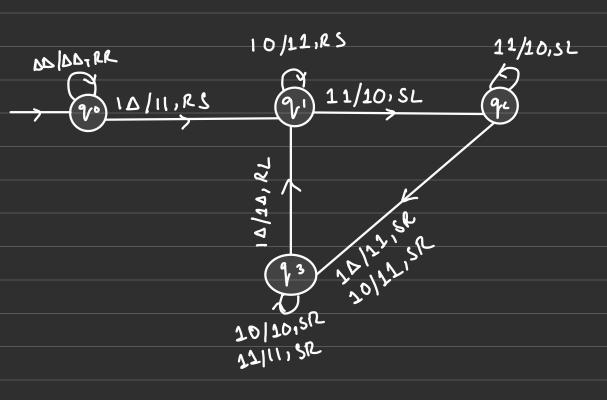
WW



Q. Convert unary representation to binary.

E.g: 1111(4)-> 100

Ti: 01111 <u>0</u>
Tz:0000





Duration: Paper Date: Section:

Quiz 3

20 Minutes

Total Marks: Weight Page(s):

211-1798

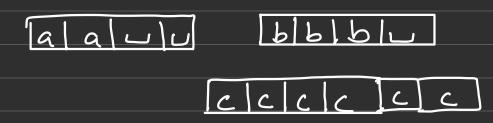
Roll No.

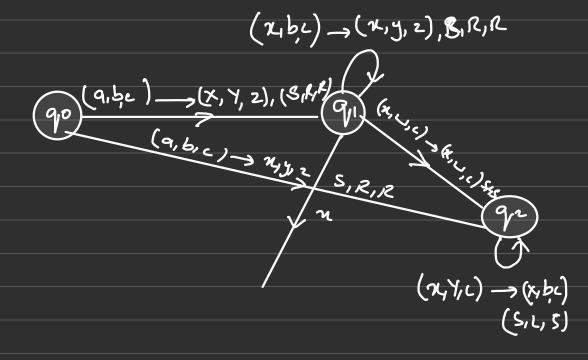
Use back side of this ass for rough work. Write down final answers only in the given space provided.

Problem # 1: Design a deterministic one-tape Turing machine, with input alphabet {a, b, c}, that accepts the language L =  $\{a^i b^j c^k \text{ where } i \ge 1, j \ge 1, \text{ and } k = \max\{i, j\}\}$ aabcc AIL abbac XL 4,R a,L aga b ccc abbbcccs aabbb cc xx - 2622 c a, R ZZZAAA a, X, 2 XX9 YY CCC 9,6 229X X,L ATL ZXaYYALL 22ZYYAAA

Z,L

Q. { aibick lij, kzl k=ixj}





Q. Add 2 Binary No.s

A: 1101 B= 0011 C=10000

٠	γ	2	Sum	<u> </u>
<b>У</b>	υ	D	0	O
0	(	0		0
Ö	Ó	1		Ó
l	D	D	1	D
1	ı	O	0	l
0	ı	1	O	i
1	0	1	0	1
(	J	1	1	7

AIBID PRIBO PERR 001 -7 001/LLL 100 -, 101 /LLL DAAA DIDIARR DIDAY YORO ILLY 0,00 -, 000/LLL 010 - OII /LLL 101 300 551 011 -7010 [55] 110-2110 | 552 AIBIOTA AIBILLS

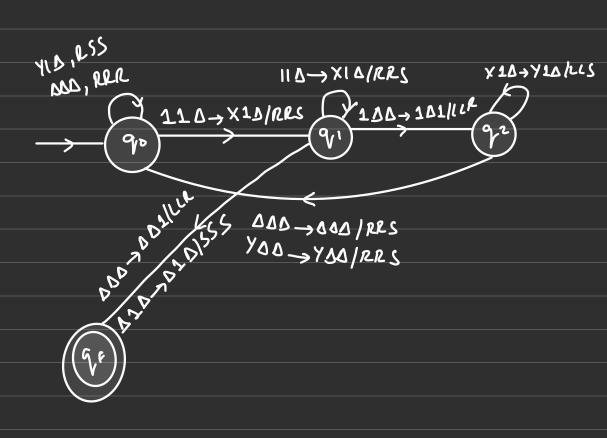
Q. Multiply 2 nos in unary form. X1->XY1/SRR >XY1/SRR tu. Stuulers

Q. Mod of 2 no.s in unary. 5.62=1 Ti: A 11 111 A T2: 1111 T3: DD DD YLD, RSS MA, RER 11 D-> XI D/RRS ×10-> 110/LLS 110-x10/RRS /100-100/LLS DDD-DDDKLS 90 Old Alolls DDD - ODD / RRS 010 YOD - YDD/RRS 021 X1∆→X11 555 D10-010/555

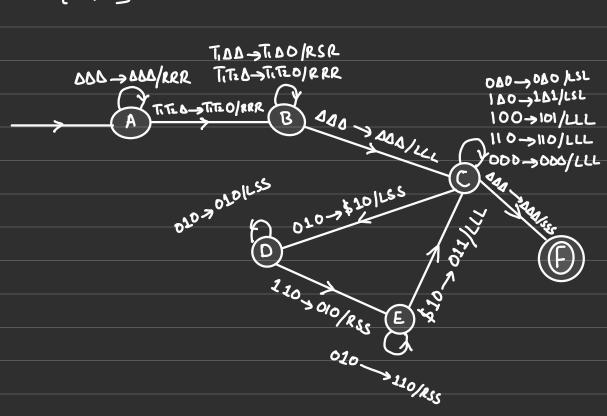
Q. Division of 2 mary no.s.

Ti: \$\Delta 1111 \Delta\$

T2: D 11D



# Q. Subtract



# MULTITRACK

### TOA-ASSIGNMENT-4

Mocez Ali Ti Dab D 21L-1798 Tz Dbba D T3 Db D T4 DD DD ...

(SRSR)

Concatenate 3 strings in To

Ti: 1 TZ: D T3:  $\triangle$  $\Delta \Delta \Delta$ Δ 111110/RRR ION; 101/RRR 011;011/RRR OON, DO OIRRR NN; MN/RRR 911

Perform XOR on Ti,Tz and store result into T3

 $I \Delta : IT$ DDD; NDD/RRR TIDA;TIDO/RSR TIED;TITEO/RRR TITZA;TITZO/RRR TI DA;TIDO/RSR DADIAAAill T100; T100/SSS 9/2 1,20,7,20/555 TITZTS, TITZTYSLS 010;010/RSI 1162/3, TITETS/LCC 157. W. 120. D1T3;01T3/SSS TI 6/3; TID/3/RRS T11T3 TI DI3; TIDI3/RRS 9,5 TITZIS T1173 T10T3 RSR RRS 110 Δ; Ti 1 Δ/LSS TIOTS; TITS/LSL ΔT2Δ; ΔT2ΔISRR (9,14) 0120;0124/SRR ΔIZT3;ΔIZT3/SRR E 101; 101/SLS 110;100/565 000;000/LLL :۵۸۸ 011;001/525 DOD/SLL. 100;110/LLL 1 11; 111/SLS 001;011/44 110;100/565 010;010/11 01A; 01A/LLS DT2 A; DT2 T2/SLL (96) Δ T2 T3; ΔT2T2/SLL 1 DD; 10D/LLS ΔΔΛ ΔΔΔ

 $\mathcal{T}_{1}$  : abbbs T2: bbbabas T3:  $\Delta \Delta \Delta$ . TI=[L= = {a,b} Th= { A1B3 J3={ D3 โก๊นโร/โก๊นโร/LSS 5/2/3; BIZIZIRSS TITZT3; TITZT3/RSS aTzTz; ATzTs/RSS aTZT3;ATZT3/LSS  $\Delta \Delta \Delta$ ;  $\Delta \Delta \Delta /RRZ$ Λίτις ΔΙ2Γς/LSS Ty 1213; Ty 1213/LSS โรโปโร TITLES T5T2T3/T5T2T3/RSS 1,55 17275 ; DIETS/RSS A TLT3 BILTS a TZTz **Ы**ปี 3 LSS LSS TITE B; TITE TI/RSR TyTe T3; TyTe T5/525 Ty a [3; TY A [3/5LS Th 1 Ts ; Th 1 13 /SLS Th a [3; In A [3/SRS 97) [45[3; TY 893/SLS 141413/5LS Th b [3; Th B [3/5R.S TITETS; TITETS/SRS T1515 ThT+13; ThT213/SRS T4/4/3 ړی و Tn D D; Tn DD/SSS T4B13 THATS Traa Tybb C RR SRR