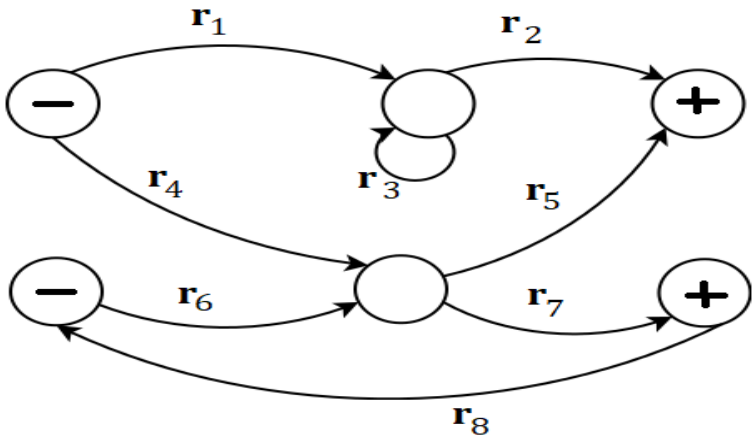
QUIZ NO.03

THEORY OF AUTOMATA

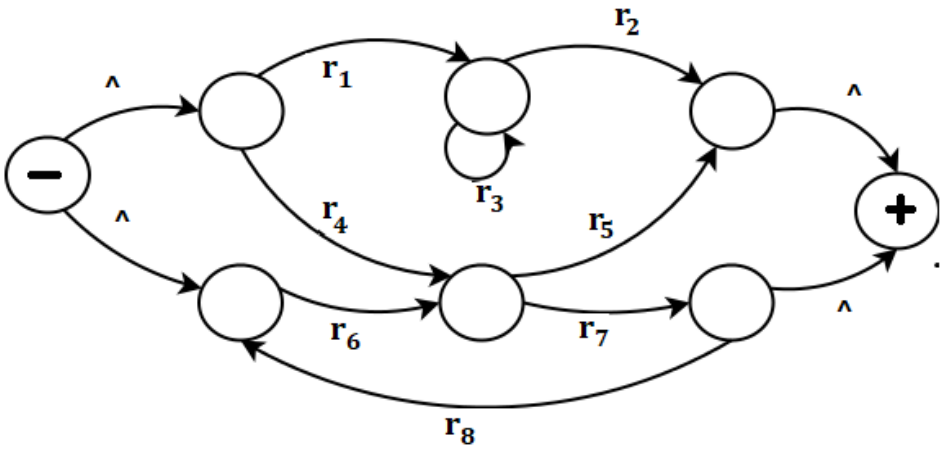
Instructor Name: Tahir Iqbal **Semester Program: Fall 2022**

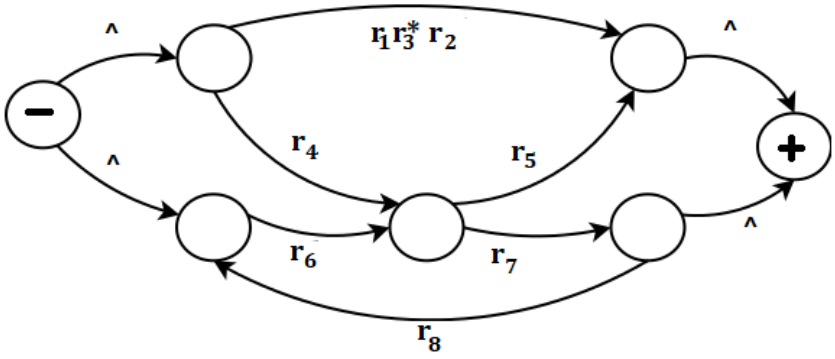
Question No.1

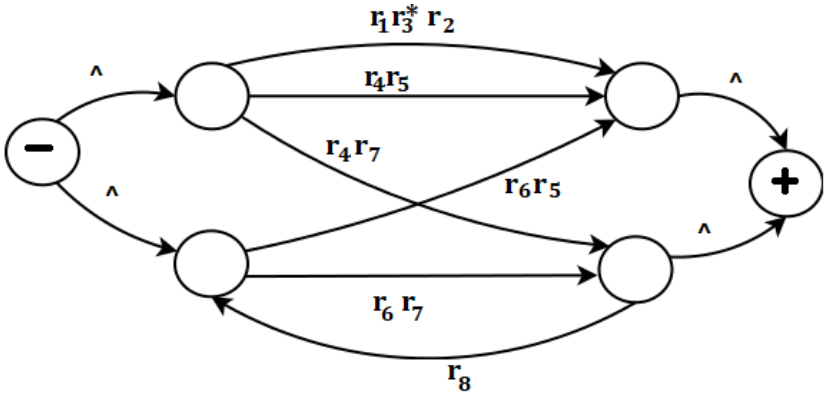
Use the TG below to get the RE of language accepted by it. Assume that r_1, r_2, …, r_8 are valid strings for the alphabet of language accepted by given TG.

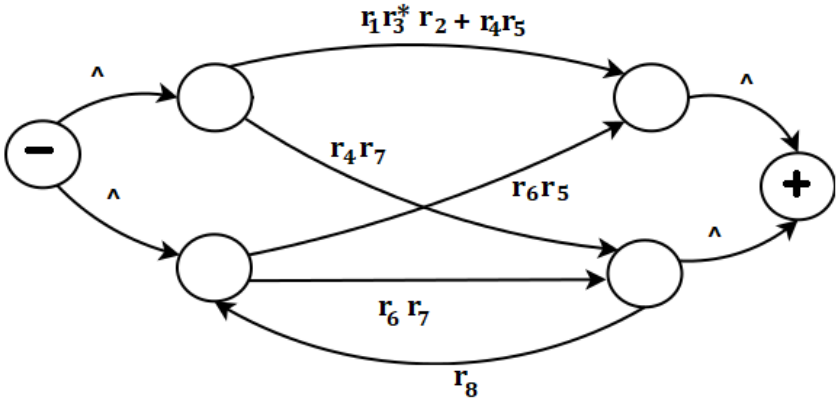


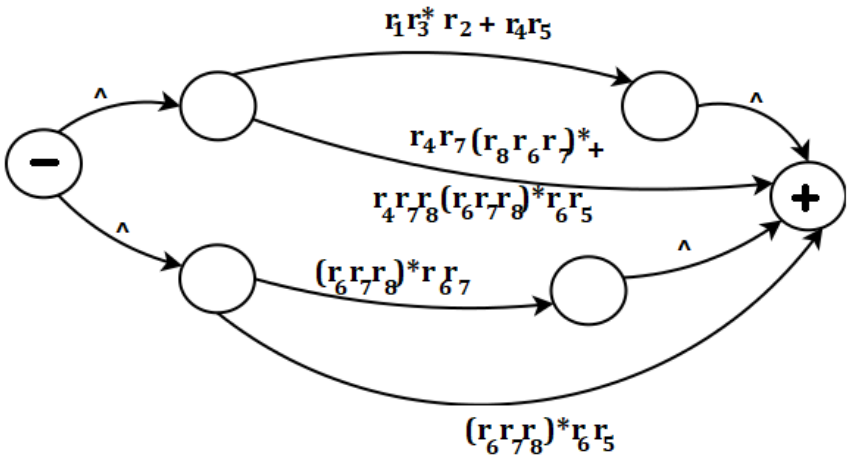
Answer:

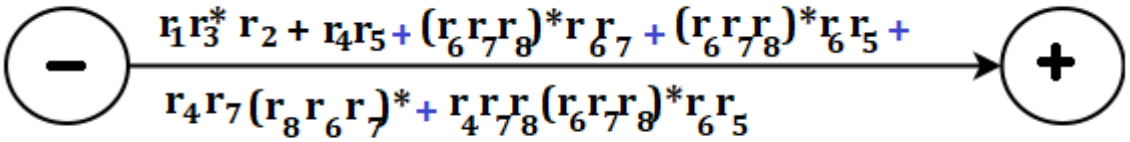



^
$r_1 r_3^* r_2$
^
^
r_4
r_5
r_6
r_7
^
r_8


$r_1 r_3^* r_2$
^
$r_4 r_5$
^
$r_4 r_7$
$r_6 r_5$
^
^
$r_6\ r_7$
r_8

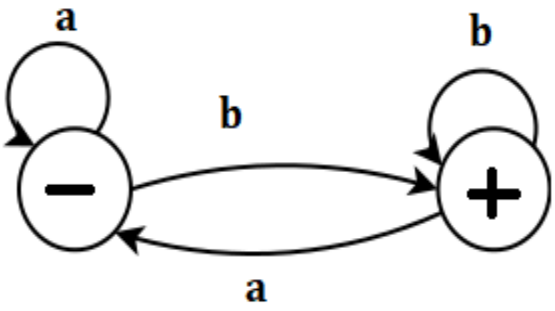

$r_1 r_3^* r_2 + r_4 r_5$
^
^
$r_4 r_7$
$r_6 r_5$
^
^
$r_6\ r_7$
r_8





Question. No.2

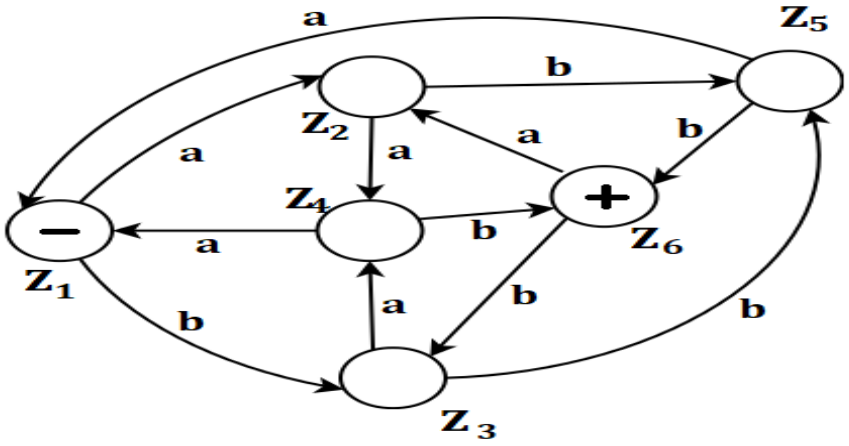
By following the Kaleen's Theorem find the closure of the given FA.



Ans

Current State	**New State on input = a**	**New state on input = b**
$-Z_1$ (X_1, Y_1)	Z_2 (X_2, Y_1)	Z_3 (X_2, Y_2)

Z_2 (X_2, Y_1)	Z_4 (X_3, Y_1)	Z_5 (X_3, Y_2)
Z_3 (X_2, Y_2)	Z_4 (X_3, Y_1)	Z_5 (X_3, Y_2)
Z_4 (X_3, Y_1)	Z_1 (X_1, Y_1)	Z_6 (X_1, Y_2)
Z_5 (X_3, Y_2)	Z_1 (X_1, Y_1)	Z_6 (X_1, Y_2)
$+Z_6$ (X_1, Y_2)	Z_2 (X_2, Y_1)	Z_3 (X_2, Y_2)



Question. No.3

Construct incrementing machine where q_0 is the start state and

Σ = {0,1},
Gema={0,1}