SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN (AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai — 600 044.
B.Sc.(Maths) - END SEMESTER EXAMINATIONS APRIL - 2023
SEMESTER - VI
14UMACE6A02 - Formal Languages and Automata Theory

Total Duration : 2 Hrs 30 Mins. **Total Marks : 60**

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Describe Phrase Structure languages.
2. Explain derivation tree.
3. Apply the grammar G with V ={S,A,B},T ={a,b} and productions p $S \rightarrow$A, A $\rightarrow aBa$ / a,B $\rightarrow bAb$ /b into Greibach normal form.
4. Explain DFA with its notations.
5. Show that a language L is accepted by some $\in$ - NFA if and only if L is accepted by some DFA.
6. Predict the language L = $\{a^n b^m : n \neq m\}$ is context- free.
7. Explain the algorithm for Reduced grammar.
8. Determine the operators of Regular Expressions.

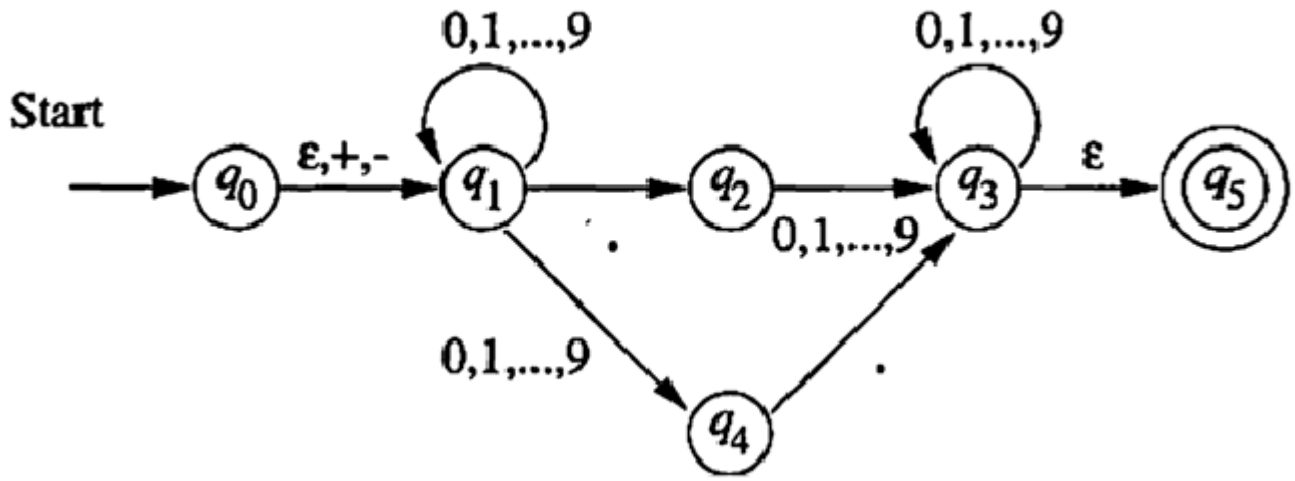
Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Explain briefly about Chomsky Hierarchy.
10. Prove that the family of context-free languages is closed under union, concatenation and star closure.
11. Define Chomsky normal form and convert the grammar with productions S $\rightarrow$ ABa, A $\rightarrow aab$, B $\rightarrow$ Ac to Chomsky normal form.
12. State and Prove Pumping Lemma for regular sets.

Contd...

13. For the below $\in$ - NFA construct the transition table and $\in$ - $closure$.



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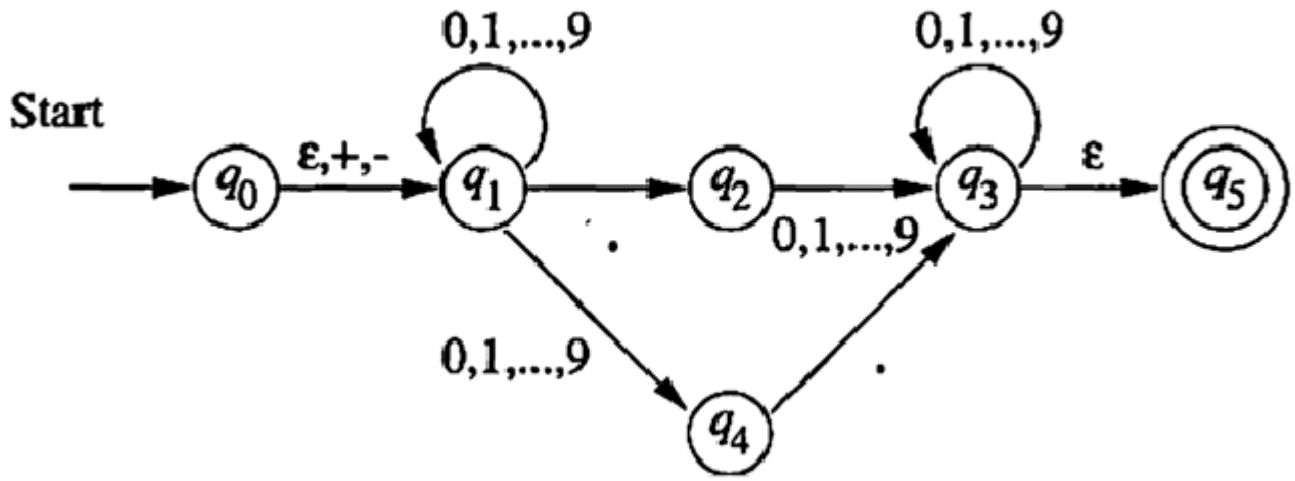

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