SYCS TOC 2/4/24 (1)

Seat No. _____

DURATION: - 2½ hrs 84102424 MARKS:- 75

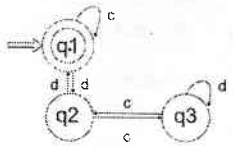
Note: - (1) All questions are compulsory.

(2) All questions carry equal marks.

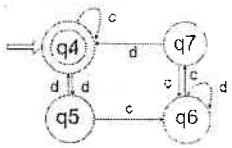
(3) Figures to the right indicates full marks

Q1.Answer any 4 out of 6 **Marks(20)**

a. Explain transition system with example? [CO1 R]
b. Construct a DFQ that accepts any strings over {a,b) that contain the string aabb in it [CO1 A]
c. Explain Non – Deterministic Finite Automata? [CO1 R]
d. Explain transition table? [CO1 R]
e. Describe components of Finite Automata? [CO1 R]
f. Check these two Automata are equivalent or not. [CO1 R]



AUTOMATON-1



AUTOMATON-2

Q2. Answer any 4 out of 6 **Marks(20)**

a. Explain Grammar? [CO2 R]
b. Explain How to generate Language by grammer with an example. [CO2 R]
c. Describe Chomsky classification of grammar. [CO2 R]
d. Explain type 1 grammar, which machine is used for type1? Which language is used for type 1? [CO2 R]
e. Describe Arden's theorem. [CO2 R]
f. Write a Rules For Regular Expression? [CO2 R]

Q3. Answer any 4 out of 6 **Marks(20)**

a. Explain context Free languages with an example? [CO3 R]
b. Draw a derivation tree. [CO3 R]
Let G=({S,A}, {a,b}, P,S)

Where ' P consists of

S-→ aAs |a| ss

A-→ SbA | ba

c. Find a reduced Grammar equivalent to the grammar G, having production [CO3 R]

P: S → Ac |B, A→ a, C→C|BC, E→ aA | e

d. Explain context Free languages? [CO3 R]

e. Convert the following Regular expression to their equivalent finite Automata [CO3 A]

1. ba*b
2. (a+b)c
3. a(bc)*

f. If G is the Grammar, S -> SbS|a, show that G is ambiguous [CO3 A]

Q4. Answer any 5 out of 6 **Marks(15)**

a. Explain when a language is accepted by a finite automata. **[CO1 R]**

b. Define state ,transition, and state-transition diagram with a suitable example.**[CO1 R]**

c. **Define derivation tree .Mention the different types of derivation tree.** [CO2 R]

d. **Design a regular expression for the language containing even number of 0's followed by odd number of 1's.** [CO2 R]

e. Explain the mathematical representation of Turing Machine with a suitable example. **[CO3 R]**

f. Construct a Turing Machine which recognizes Language $L= 0^N 1^N$ [CO3 R]