



TONTADARYA COLLEGE OF ENGINEERING

(Department of CSE)

Internal Assessment – II (18CS54)

Subject : ATC
Semester : V

Date : 21.12.2021
Time : 12pm to 1.30pm

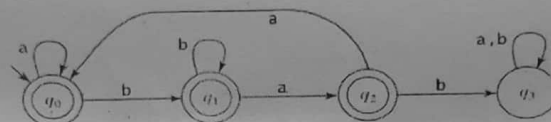
Answer following questions choosing one question from each part
PART-A

Total Marks: 50
CO

- Q1 a) Consider the grammar: $S \rightarrow aS \mid aSbS \mid \epsilon$
Is the above grammar ambiguous? Show that the string "aab" has two
12M (CO3)
- i) Parse trees
ii) Left most derivations
iii) Right most derivations
- b) Convert following RE's into FSM's
13M (CO3)
- (i) $(ab^*)^*$ (ii) $(a+b)ab$ (iii) $a^* + b^*$

OR

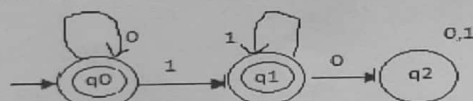
- Q2 a) Construct the regular expression for the following
12M (CO3)
- a. $\{w \in \{a, b\}^* : \text{every } a \text{ in } w \text{ is immediately preceded and followed by } b\}$.
b. $\{w \in \{a, b\}^* : w \text{ does not end in } ba\}$.
c. $\{w \in \{0, 1\}^* : w \text{ has } 001 \text{ as a substring}\}$.
d. $\{w \in \{a, b\}^* : w \text{ has both } aa \text{ and } bb \text{ as substrings}\}$.
- b) Obtain the RE for the FA



13M (CO3)

PART-B

- Q3 a) Obtain the Regular Expression by eliminating the states?
12M (CO4)



b)

Show that the following grammars are ambiguous.

- a) $S \rightarrow SbS \mid a$
b) $S \rightarrow iCtS \mid iCtSeS \mid a, C \rightarrow b$

12M (CO4)

OR

- Q4 a) Construct FSM for the following regular grammar

- (i) $S \rightarrow aT$
 $T \rightarrow bT$
 $T \rightarrow aT \rightarrow aW$
 $W \rightarrow \epsilon$
 $W \rightarrow aT$

- (ii) $S \rightarrow bS$
 $S \rightarrow aT$
 $S \rightarrow \epsilon$
 $T \rightarrow bS$

12M (CO4)

- b) Write the CFG for following languages.

- a. $L = \{a^n b^n \mid n \geq 0\}$
b. $L = \{a^{2n} b^n \mid n \geq 0\}$
c. $L = \{a^n b^{2n} \mid n \geq 0\}$
d. $L = \{a^{2n} b^n \mid n \geq 1\}$
e. $L = \{a^n b^{2n} \mid n \geq 1\}$
f. $L = \{a^n b^{n+1} \mid n \geq 0\}$

12M (CO4)

Course Outcome	Complete Title
CO3	Describe that properties of regular languages are used to decide whether the language is finite, infinite, regular, and not regular.
CO4	. Construction of grammar. and recognizes for different formal languages