

Roll No.

Total No. of Pages : 02

Total No. of Questions : 18

B.Tech. (IT) (Sem.-5)

FORMAL LANGUAGE & AUTOMATA THEORY

Subject Code : BTIT-501-18

M.Code : 78256

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students has to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students has to attempt any TWO questions.

SECTION-A

Answer briefly :

- 1) Define Finite Automaton.
- 2) What are various properties of transition function?
- 3) Define grammar and language.
- 4) Differentiate between left and right context in languages.
- 5) Define yield in CFG.
- 6) Define ambiguity in CFG.
- 7) Define TM.
- 8) Define the term acceptability in PDA.
- 9) Give instantaneous description of Turing machine.
- 10) Differentiate between DFA and NDFAs.

SECTION-B

- 11) Write a note on canonical derivations.
- 12) Discuss the formal properties of LL(k) and LR(k) grammars.
- 13) Explain the concept of ambiguity with the help of example.
- 14) Construct a Moore machine equivalent to the Mealy machine M defined by following table :

Present State	Next State			
	a = 0		a = 1	
	State	Output	State	Output
→ q ₁	q ₁	1	q ₂	0
q ₂	q ₄	1	q ₄	1
q ₃	q ₂	1	q ₃	1
q ₄	q ₃	0	q ₁	1

- 15) Find a reduced grammar equivalent to the given grammar.

$S \rightarrow AB$ $A \rightarrow a$ $B \rightarrow b$ $B \rightarrow C$ $E \rightarrow c$

SECTION-C

- 16) Write a note on cellular automaton and rewriting systems.
- 17) Design PDA for $\{a^m b^n \mid m > n\}$
- 18) Design Turing machine of $\{0^n 1^n \mid n \geq 1\}$

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.