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 NDFA.

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 grammer.

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

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 Truing machine of $\{0^n 1^n \mid n >= 1\}$

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.