ACE
Engineering College

(An Autonomous Institution)

Question Paper Code: CS416PC

ACE-R20

Semester End Examination
II B. Tech- II Semester- AUGUST -2022
Formal Language and Automata Theory

Common to CSM, CSD

Time: 3 Hours **Max. Marks: 70**

H. T. No										

Answer any 5 Questions out of 8 Questions from the following

Q.No	Question	Marks
1. a)	What is Automata Theory? Explain with example	7
b)	Design a DFA which accepts the strings starting with 'a' and ending with 'b' over $\Sigma = \{a, b\}$	7
2. a)	Construct NFA for $(0 + 1)^*010(0 + 1)^*$?	7
b)	Design a Moore Machine to determine the residue mod 4 for each binary string treated as integer?	7
3. a)	What are the applications of Regular Expressions?	7
b)	Simplify the Regular Expression - $\epsilon + 1^*(011)^*(1^*(011)^*)^*$	7
4. a)	Construct a finite Automaton to accept the regular expression $(0+1)^*\ (00+11)(0+1)^*$	7
b)	Show that the following grammar is ambiguous with respect to the string aaabbabbba. S-> aB | bA A-> aS| bAA|a B-> bS | aBB | b	7
5. a)	Convert the right linear grammar to left linear grammar S-->bB B-->bC B-->aB C-->a B-->b	7
b)	Design a Push Down Automaton for the language $L=\{a^n b^{2n} \mid n>=1\}$	7
6. a)	Prove that the Following Language is not Context free language $L=\{www \mid w \in \{a,b\}^*\}$.	7

6. b)	Optimize the CFG given below by reducing the grammar, S is the start symbol. S->A|0C1 A->B|01|10 C->€|CD	7
7. a)	Construct a Turing machine to recognize the language $L=\{a^n b^n \mid n>=1\}$	7
b)	Explain about the Decidability of Post Correspondence Problem.	7
8. a)	Write the properties of recursive languages.	7
b)	Discuss briefly about decidability and undecidability problems?	7