

18U333

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Name:

Reg. No.

THIRD SEMESTER B.C.A. DEGREE EXAMINATION, NOVEMBER 2019

(Regular/Supplementary/Improvement)

(CUCBCSS-UG)

CC17U BCA3 C06 - THEORY OF COMPUTATION

(Complementary Course)


(2017 Admission onwards)

Time: Three Hours

Maximum: 80 Marks

PART A

Answer *all* questions. Each question carries 1 mark.

1. Define equivalence class.
2. Write the string that can be generated by $S \rightarrow d / bA, A \rightarrow d / ccA$
3. Define DPDA
4. Define terminal and non terminal strings.
5. Let $\Sigma = \{0, 1\}$, find Σ^*
6. List the operations under which regular languages are closed.
7. What is Abelian Group?
8. Write the regular expression for the figure 
9. If $w = aba$, find length of w .
10. Expand NPDA

(10 x 1 = 10 Marks)

PART B

Answer *all* questions. Each question carries 2 marks.

11. What do you mean by Language of automation?
12. What are Turing Machines?
13. What is Greibach Normal Form?
14. What do you mean by proof by contradiction?
15. Define regular grammar.
16. Draw the DFA for the language $L = \{a^n : n \geq 0, n \neq 4\}$
17. What are epsilon transitions?
18. What is Context Free Languages?

(8 x 2 = 16 Marks)

PART C

Answer any *six* questions. Each question carries 4 marks.

19. Compare graphs and trees.
20. Differentiate Mealy and Moore models.

21. Write a note on regular expressions with example.
22. Construct a pushdown automation for the language $L = \{ww^R : w \in \{a, b\}^*\}$
23. Differentiate between recursive and recursively enumerable sets.
24. Describe about DFA state minimization.
25. What is Chomsky Normal Form? Convert the given grammar into CNF.
 $S \rightarrow ABa$
 $A \rightarrow aab$
 $B \rightarrow Ac$
26. Discuss proof by induction with example.
27. Write a note on Automata.

(6 x 4 = 24 Marks)

PART D

Answer any *three* questions. Each question carries 10 marks.

28. Explain Chomsky classification of languages in detail.
29. Construct a Turing Machine for the language $L = \{a^n b^n : n \geq 1\}$
30. Define DFA and NFA. Also write the procedure for the conversion of NFA to DFA.
31. Explain with example:
 - a) Derivation Tree
 - b) Ambiguous Grammar
32. Explain closure properties of regular languages.

(3 x 10 = 30 Marks)
