

B.C.A.- III (CBCS Pattern) Semester - V
001 - Elective-I Paper-I : Theory of Computational Analyzer

P. Pages : 2

Time : Three Hours



GUG/S/23/13076

Max. Marks : 40

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- Notes :
1. All Questions are compulsory and carry equal marks.
 2. Draw neat and labelled diagrams wherever necessary.
 3. Avoid vague answers and write answers relevant and specific to questions only.

Either:

1. a) Explain the working of Finite Automation in detail. 4
- b) Construct a FA for the set of all strings containing at least three consecutive zeros anywhere in the string over $\Sigma = \{0,1\}$. 4

OR

- c) What are the types of FA? List all and explain any one in detail. 4
- d) Construct a NFA for Regular Expression $R = (0+1)^*01$. 4

Either:

2. a) What is Chomsky Normal Form? Explain how to convert a CFG to CNF with suitable example. 4
- b) What is Parse Tree? Explain in detail. 4

OR

- c) what is Useless Symbol? Explain how to remove Useless Symbol from given Grammar. 4
- d) Prove that $L = \{a^i b^j \mid j = i^2\}$ is not regular. 4

Either:

3. a) Draw and explain the model of PDA in detail. 4
- b) Design a PDA for accepting a language $L = \{a^n b^n \mid n \geq 1\}$ 4

OR

- c) Write a note on 4
 - i) Language accepted by empty tack
 - ii) Language accepted by final State

- d) Prove that $L = \{0^n 1^n \mid n \geq 1\}$ is not a CFL. 4

Either:

4. a) Explain the structure of compiler in detail. 4
b) Draw the Transition Diagram for Constant. Explain. 4

OR

- c) Describe the working of Code Optimization in detail. 4
d) Explain the Error Handling in detail. 4

5. Attempt all the questions.

- a) Define Finite Automation. 2
b) Define Context Free Grammar. 2
c) Give the formal definition of Turing Machine. 2
d) Define Compiler. 2
