B.C.A. - III (CBCS Pattern) Semester-V

001 - Elective-I Paper-I : Theory of Computational Analyzer

P. Pages : 2 **GUG/W/24/13076**

Time : Three Hours * 4 9 1 3 * Max. Marks : 40

Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat and labelled diagram and use supporting data whenever necessary.
3. Avoid vague answer and write specific answer related to question.

Either:

1. a) List all types of finite Automaton. Explain any two in detail. **4**

b) Construct NFA for the following Regular Expression $R = 10 + (0 + 11)0^*1$. **4**

OR

c) What is the acceptance of string in finite Automaton? Explain with suitable example. **4**

d) Construct a FA for the set of all strings ending with '00' over $\Sigma = \{0,1\}$. **4**

Either:

2. a) What is Useless symbol? Explain how to remove useless symbol from a grammar with suitable example. **4**

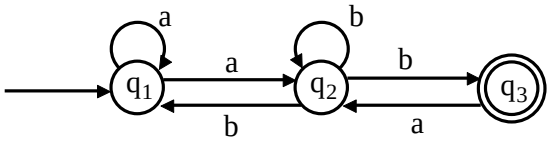
b) Prove following language is not regular language. **4**

$L = \{a^n b^{2n} \mid n \geq 1\}$

OR

c) Define Chomsky Normal form. Explain how to convert given grammar to CNF with suitable example. **4**

d) Obtain regular expression corresponding to the following F.A. **4**



Either:

3. a) Draw the block diagram of PDA. Explain its working in detail. **4**

b) Construct a TM for the following REL. **4**

$L = \{0^n\ 1^n\ 0^n \mid n \geq 1\}$

OR

c) What is Pumping lemma for context free languages? Explain is application in detail. **4**

d) Construct a PDA equivalent to the following CFG. **4**

$S \rightarrow 0BB$

$B \rightarrow 0S \mid 1S \mid 0$

Check whether 010000 is accepted or not.

Either:

4. a) Explain syntax analysis in detail. **4**

b) Write a note on with suitable example. **4**

i) Common subexpression elimination.

ii) Induction variable analysis.

OR

c) Describe book keeping in detail. **4**

d) Define compiler. List and explain the types of compiler in detail. **4**

5. Solve all the questions.

a) Give the theoretical and formal definition of FA. **2**

b) What is derivation? Explain Derivation Trace with suitable example. **2**

c) What is Linear Bounded Automaton? Explain. **2**

d) List the various sources of code optimization. **2**

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