Bachelor of Computer Application - III Fifth Semester
## 5BCA1 – Paper - I : Theory of Computational Analyzer

––––––––––––––––––––––––––––––––––––––––––––––––––––––––––––––––––––––––––––––––

Notes :    1.    All questions are compulsory and carry equal marks.
2.    Draw neat and labelled diagram wherever necessary.
3.    Avoid vague answers and write specific answers related to questions.

**1.    Either :**

a)    Explain Finite Automation model in detail.    **8**

b)    Design a Finite Automata to check whether a given unary number is divisible by three.    **8**

**OR**

c)    Explain Equivalence between NFA and DFA.    **8**

d)    Construct DFA for the set of all string containing at least two consecutive zero any where in the string $\Sigma = \{0,1\}$.    **8**

**2.    Either :**

a)    State and prove the pumping for regular sets.    **8**

b)    Check whether the language $L = \{0^n \mid n \text{ is prime}\}$ is regular set or not.    **8**

**OR**

c)    Show that $L = \{0^i 1^i \mid i \geq 1\}$ is not regular.    **8**

d)    Explain Greibach Normal form in detail.    **8**

**3.    Either :**

a)    Construct a PDA equivalent to the following grammar.    **8**

   $S \rightarrow aAA$
   $A \rightarrow aS \mid bS \mid a$

b)    Show that $\{a^i \mid i \text{ is prime}\}$ is not a context – free language.    **8**

**OR**

c)    Explain push down Automata.    **8**

d) Design Turing machine to recognize the following language **8**

$$L\left\{0^n 1^n 0^n \mid n \ge 0\right\}.$$

4. **Either :**

a) Describe Lexical analysis and syntax analysis. **8**

b) Explain error handling process in the compilation. **8**

**OR**

c) Explain principle source of code optimization in detail. **8**

d) Discuss parse tree construction in detail. **8**

5. Solve all the questions.

a) Write a note on deterministic Finite Automation. **4**

b) Explain context free grammar in brief. **4**

c) Explain multiple tape TM in brief. **4**

d) Explain types of Compiler. **4**

**\*\*\*\*\*\*\*\*\*\***