

M.Sc.- I (Computer Science) CBCS Pattern Semester-II
PSCSCT05 - Paper-I : Theory of Computation & System Programming

P. Pages : 2

Time : Three Hours



GUG/W/23/11187

Max. Marks : 80

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

Either:

1. a) Construct a NFA for regular expression 01^*+1 . 8
b) Explain the concept of Finite Automata with output in detail. 8

OR

- c) Prove that the class of regular set is closed under complementation. 8
d) Find a grammar in Chomsky normal form equivalent to grammar G, 8
 $S \rightarrow aAbB$
 $A \rightarrow aA / a$
 $B \rightarrow bB / b$

Either:

2. a) Design a PDA for accept in. 8
 $L = \{a^n b^m c^n / m, n \geq 1\}$
b) Prove that Context free languages are closed under union, concatenation and Kleene closure. 8

OR

- c) Define Turing Machine and explain modifications of Turing machine. 8
d) Explain the Chomsky Hierarchy in detail. 8

Either:

3. a) Explain the Role of Device Drivers in detail. 8
b) What is compiling and loading? Explain it in detail. 8

OR

- c) Explain the concept of kernel symbol table in detail. 8
d) Explain following. 8
i) Security Issues ii) Interaction and shutdown

Either:

4. a) Explain following- 8
- i) Loading schemes.
 - ii) Linking.
- b) What is memory segmentation and Address computation? Explain in detail. 8

OR

- c) Explain CPU Architecture of 8086 family. 8
 - d) Write a note on Interrupts and their Routines. 8
- 5 Attempt all the questions.
- a) Write the application of finite Automata. 4
 - b) Explain PDA along with it's Block diagram. 4
 - c) Write a short note on version Numbering. 4
 - d) What is Near and far procedures? 4
