

M.Sc.(Computer Science)-I Second Semester Old
2MSC1 - Theory of Computation and System Programming Paper - I

P. Pages : 2

Time : Three Hours



GUG/W/18/2868

Max. Marks :80

- Notes :
1. All questions are compulsory and carry equal marks.
 2. Draw neat and labelled diagrams and use supporting data wherever necessary.
 3. Avoid vague answers & write specific answers related to questions.

1. Either

- a) Construct a DFA equivalent to following NFA.

8

States	0	1
p	p, q	p
q	r	r
r	s	-
s	s	s

- b) Convert the given regular Expression into equivalent DFA. $10+(0+11)0^*1$.

8

OR

- c) State and prove pumping lemma for regular sets.

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- d) Define Chomsky normal forms. Find the grammar in CNF. equivalent in grammar G

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$S \rightarrow aAbB$

$A \rightarrow aA|a$

$B \rightarrow bB|b$

2. Either

- a) Design a PDA for accepting language.

8

$$L = \{wcw^R \mid w \text{ is in } (0+1)^*\}$$

- b) Explain Restricted Turing machine and church's hypothesis in detail.

8

OR

- c) Design a Turing machine to recognize set of strings with an equal no. of 0's and 1's

8

- d) Explain closure properties of context free languages (cover all the 8 properties)

8

3. Either

- a) Explain procedure for building and running modules in system programming.

8

- b) Explain use of kernel symbol table in system programming in detail.

8

OR

- c) Explain role of device drivers in detail.

8

- d) Explain the security issues in device drivers in brief. 8
4. Either
- a) Explain the concept of memory segmentation in detail. 8
- b) Explain processing of Binary, ASCII, and BCD data in detail. 8
- OR**
- c) Explain phases of compiler in detail. 8
- d) Explain addressing mode of 8086 in detail with example of each. 8
5. Solve all the questions.
- a) Define the following 4
- i) Ambiguous Grammar
- ii) Parse tree
- iii) useless production
- iv) Content free Grammar.
- b) Define PDA, Explain its block diagram and acceptability of languages by PDA. 4
- c) Write a short note on: Doing it in user space explain. 4
- d) Write short note on: 4
- i) Linking.
- ii) Relocation.
