M.Sc. - I (Computer Science) - I Sem-II

2MSC1 - Paper-I : Theory of Computation and System Programming

P. Pages : 2 **GUG/S/19/2868**

Time : Three Hours * 3 6 4 1 * Max. Marks : 80

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

1. Either.

a) Let $G = (\{A_1, A_2, A_3\}, \{a, b\}, P \cdot A_1)$ Find GMF equivalent to the following CFG. **8**

$A_1 \rightarrow A_2 A_3$

$A_2 \rightarrow A_3 A_1 \mid b$

$A_3 \rightarrow A_1 A_2 \mid a$

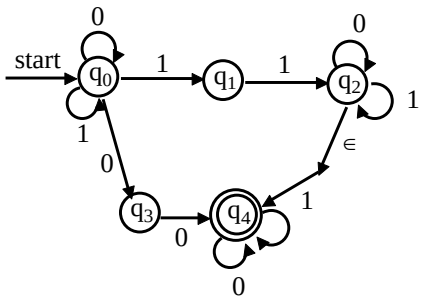
b) Convert the given Regular expression into equivalent DFA. **8**

i) 10 + (0+11) 0* 1. ii) 01 [((10)* +111)*+0]* 1.

OR

c) The grammar G is given as $S \rightarrow sbs \mid a,$ show that G in ambiguous. **8**

d) Give the transition table for the NFA given in fig far sming x = 0100. **8**



2. Either.

a) Design a TM to recognize the language $L = \{0^n 1^n / n \geq 1\}$. **8**

b) Prove that $L = \{a^i b^i c^i \mid i \geq 1\}$ is not CFL. **8**

OR

c) Design a PDA for accepting **8**

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

d) Design turning machine to compute n^2. **8**

3. Either.

a) Write a short note on: **8**
i) Compiling. ii) Loading.

b) Explain kernel modules Vs Application in detail. **8**

OR

c) Explain running modules in detail. **8**

d) Discuss the security issues for device drivers. **8**

4. Either.

a) Explain CPU architecture of 8086. **8**

b) Discus the overview of compilation process. **8**

OR

c) Write a short note on: **8**
i) Linking. ii) Functions.

d) Differentiate between Relocation and program re-location. **8**

5. Solve all the questions.

a) Write a short note on finite Automata. **4**

b) Write a note on context free languages. **4**

c) Write a note on Interaction and shutdown. **4**

d) Write a note on address computation. **4**

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