B.C.A. - III (Sci)(with Credits)-Regular-Semester 2012 Sem V

5BCA1 - Paper-I : Theory of Computational Analyzer

P. Pages : 2 **GUG/S/18/3279**

Time : Three Hours * 0 4 6 7 * Max. Marks : 80

Notes : 1. All questions are compulsory and carry equal marks.
2. Draw neat and labeled diagram and use supporting data wherever necessary.
3. Avoid vague answer and with specific points/answer related to questions.

1. Either

a) Explain in detail. **8**

i) Deterministic finite Automation.

ii) Non-Deterministic Tuite Automation.

b) Construct NFA equivalent to following Regular expression. **8**

$R = 10 + (0+11)0^*1$

OR

c) Explain application of finite Automate in detail. **8**

d) Construct DFA for the set of all strung containing at least two consecutive zero any where in the sting. **8**

oner $\sum = \{0,1\}$.

2. Either

a) Find Greibach Normal form equivalent to the following CFG. **8**

$S \to AA \mid 0$

$A \to SS \mid 1$

b) Show that **8**

i) $L = \{ww / w \in \{a,b\}^*\}$.

ii) $L = \{a^{2n'} \mid n \geq 1\}$ is regular?

OR

c) What is the use of pumping lemma? **8**

Prove $h = \{0^m 1^n 0^{m+n} / m, n \geq 1\}$ is not regular.

d) Define useless symbol and find CFG with no useless symbol equivalent to **8**

$S \to AB \mid CA$ $A \to a$

$B \to BC \mid AB$ $C \to aB \mid b$

3. Either

a) Construct TM to perform addition of two positive numbers m and n ie m+n **8**

b) Construct a PDA equivalent to the following CFG **8**

$S \rightarrow OBB$

$B \rightarrow OS \mid IS \mid O$

check whether 010^4 is in N(A).

OR

c) Construct a PDA to accept the language. **8**

$L = \sum D^n 1^{2n} \{n \geq 1\}$

d) Prove L = {The set of all stings containing equal no of a's, b's and c} is not a CFL. **8**

4. Either

a) Explain lexical Analysis in detail. **8**

b) Explain Parse tree construction in detail. **8**

OR

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

d) Define DAG. Explain the role of construction of DAG with suitable example. **8**

5. Solve all questions.

a) Explain the types of FA. **4**

b) Explain equivalence between RE and FA. **4**

c) Explain in detail Turing machine. **4**

d) Explain different types of compiler. **4**

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