B.C.A.- III CBCS Pattern Semester-V

001 - Elective Paper-I : Theory of Computational Analyzer

P. Pages : 2 **GUG/W/23/13076**

Time : Three Hours * 5 0 5 5 * Max. Marks : 40

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

Either:

1. a) Draw the block diagram of FA. Explain working of each unit in detail. **4**

b) Construct NFA for the following R.E.; **4**
R = 01*+1

OR

c) Write a note on **4**
i) 2DFA ii) NFA with $\in$ - moves.

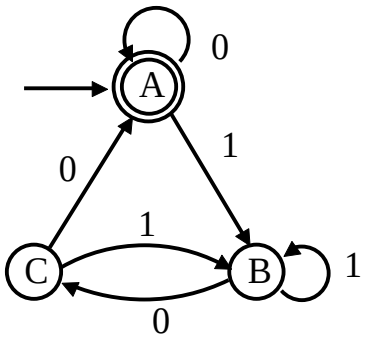
d) Construct DFA equivalent to NFA **4**
$M = (\{p, q, r, s\}, \{0,1\}, \delta, p, \{s\})$
Where δ is as follows.

Q	I/P	
	0	1
p	p, q	p
q	r	r
r	s	-
s	s	s

Either:

2. a) What is Ambiguous grammar? Explain with suitable example. **4**

b) Obtain Regular Expression equivalent to following FA. **4**



OR

c) Find a grammar in Chomsky Normal form equivalent to following CFG. **4**

$S \rightarrow aAbB$

$A \rightarrow aA \mid a$

$B \rightarrow bB \mid b$

d) Define Useless symbol in grammar? Explain it with suitable example. **4**

Either:

3. a) Construct PDA for the following CFL **4**

$L = \left\{ a^n b^{2n} \mid n \geq 1 \right\}$

b) Explain the following **4**

i) Offline TM ii) Multitape TM.

OR

c) Draw the block diagram of TM. Explain each unit in detail. **4**

d) Construct PDA equivalent to following CFG. **4**

$S \rightarrow aAA$

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

Either:

4. a) List and explain any two principle sources of code optimization. **4**

b) Explain syntax analysis in detail. **4**

OR

c) Describe Book keeping in brief. **4**

d) List the types of compiler. Explain any two in detail. **4**

5. Solve all the questions.

a) Give the formal definition of FA. **2**

b) What is Regular grammar? Explain. **2**

c) Define push down Automation. **2**

d) Explain the role of code optimization. **2**

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