FACULTY OF ENGINEERING

B. E. 3/4 (CSE) II - Semester (Old) Examination, December 2009/Jan., 2010

Subject : Automata Languages and Computation

Time : 3 Hours}   {Max. Marks: 75

Note: Answer **all** questions of Part - A and any **five** from Part-B.

PART – A (25 Marks)

1.   Over alphabet ε = {a, b} and write a Regular expression
      " with even no. of 'a' 3 followed by odd no. of 'b's ? and draw FA ?
2.   Define Algebric Laws for Regular expression.
3.   Define Homomorphism. give one example.
4.   Explain applications of CFG.
5.   Define CNF (Chomsky Normal Form). Give one example.
6.   Define inherent Ambiguity.
7.   Define Language of a PDA.
8.   Define Multitape Turing Machine.
9.   State Halting problem
10.   Define the class NP.

PART – B (5x10=50 Marks)

11.   Convert NFA in DFA.   (10)
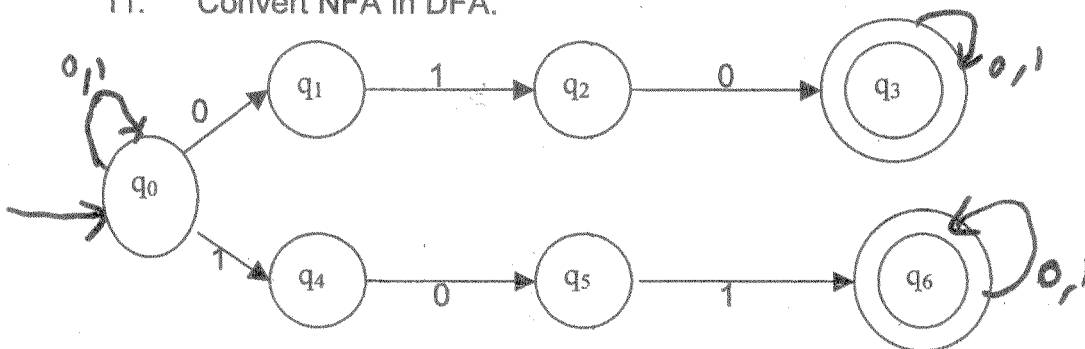
12.(a) State and prove "Pumping lemma for CFL".   (5)
   (b) Convert this grammar into Normal Form ?   (5)

$S \to ASB / \varepsilon$

$A \to aAS / a$

$B \to SbS / A / bb$

13.   Convert PDA to CFG .
      P = ({P, q}, {0, 1}, {X, Z_0}, δ, q Z_0) and δ is given by
      (a) δ(q, 1, z_0) = {(q, X, Z_0)}   (b) δ(q, 1, X) = {(q, XX)}
      (c) δ(q, 0, X) = {(P, X)}   (d) δ(q, ε, X) = {(q, ε)}
      (e) δ (P, 1, X) = {(P, ε}   (f) δ (P,0,Z_0) = {(q, Z_0)}   (10)

14.   Enumerate TM to perform proper substraction function.   (10)
15.   State and prove Rice Theorem.   (10)
16.   Explain FA with Epsiton Transitions.   (10)

17.

	0	1
→ A	B	A
B	A	C
C	D	B
*D	D	A
E	D	F
F	G	E
G	F	G
H	G	D