Code.No: NR-RR310504 | NR/RR | SET-1

III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
THEORY OF COMPUTATION
(COMMON TO CSE, CSS, CSIT)

Time: 3hours **Max.Marks:80**

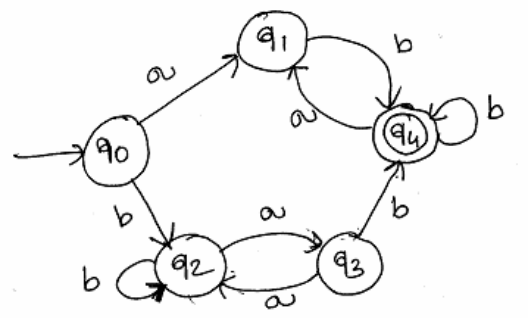
Answer any FIVE questions
All questions carry equal marks
- - -

1.a) Show that for every NFA there exists an equivalent DFA.
b) Design DFA to accept strings of 0^1s and 1^1s such that strings end with 1110. [8+8]

2.a) Convert the Mealy machine into equivalent moore machine as shown in the table

Present state	Next State			
	a=0		a=1	
	State	Output	State	Output
q_0	q_0	0	q_1	1
q_1	q_2	1	q_0	0
q_2	q_1	2	q_2	2

b) Minimize the following finite automata and show both given and reduced are equivalent. [8+8]



3. Construct NFA for the following regular expressions.
a) 0 + 10* + 01*0
b) (0 +1)* (01 + 110) [8+8]

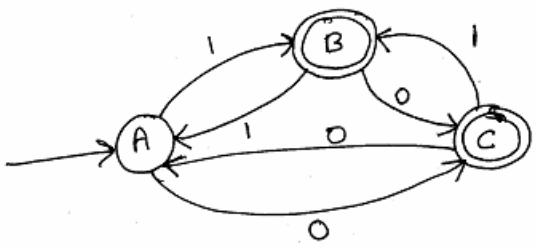
4.a) What is the languge generated by the CFG.

$S \rightarrow asb \mid aAb \mid aBb$

$A \rightarrow aA \mid a$

$B \rightarrow Bb \mid b$

b) Obtain a right linear and left – linear grammer for the following FA. [8+8]



5.a) Convert the following grammer to GNF.

$A_1 \rightarrow A_2 A_3$

$A_2 \rightarrow A_3 A_1 \mid b$

$A_3 \rightarrow A_1, A_2 \mid a$

b) Prove that $L = \{a^n b^n / n \geq 1\}$ not context – free language. [8+8]

6.a) Design PDA accepting L by empty stack equivalent to the following CFG.

$S \rightarrow oBB$

$B \rightarrow oS / IS / o$

Test whether $0 \mid 0^4$ is accepted by the PDA

b) Construct a CFG which accepts N (A) and simplify the same where [8+8]

A = $(\{q_0, q_1\}, \{a, b\}, \{Z_0, Z\}, \delta, q_0, Z_0, \phi)$ where δ is given by

$\delta(\{q_0, b.Z_0) = \{q_0, ZZ_0\}$

$\delta(q_0, \varepsilon, Z_0) = \{q_0, \in\}$

$\delta(q_0, b, z) = \{q_0, ZZ\}$

$\delta(q_0, a, Z) = \{q_1, Z\}$

$\partial(q_1, b, z) = \{q_1, \in\}$

$\partial(q_1, a, Z_0) = \{q_0, Z_0\}$

7.a) Design a turing Machine for the following language.

$L = \{ww^R \mid W \in (a \mid b)^*\}$

b) Discuss the types of tuning machines. [8+8]

8.a) Explain the Chomsky Hierarchy of languages

b) What is post correspondence problem? Is there any solution for the following PCP problem? If so give the solutions if not discuss why. [8+8]

	LIST A	LIST B
i	w_i	x_i
1 2 3	00 001 1000	0 11 011

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Code.No: NR-RR310504 | NR/RR | SET-2

III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
THEORY OF COMPUTATION
(COMMON TO CSE, CSS, CSIT)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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1. Construct NFA for the following regular expressions.
   c) 0 + 10* + 01*0
   d) (0 +1)* (01 + 110) [8+8]

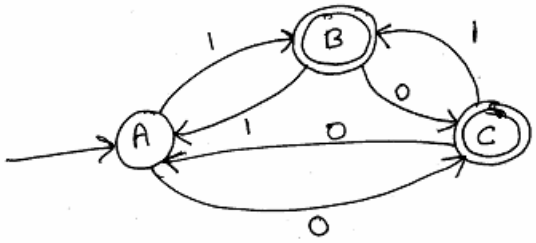
2.a) What is the languge generated by the CFG.

$S \rightarrow asb \mid aAb \mid aBb$

$A \rightarrow aA \mid a$

$B \rightarrow Bb \mid b$

b) Obtain a right linear and left – linear grammer for the following FA. [8+8]



3.a) Convert the following grammer to GNF.

$A_1 \rightarrow A_2 A_3$

$A_2 \rightarrow A_3 A_1 \mid b$

$A_3 \rightarrow A_1, A_2 \mid a$

b) Prove that $L = \{a^n b^n / n \geq 1\}$ not context – free language. [8+8]

4.a) Design PDA accepting L by empty stack equivalent to the following CFG.

$S \rightarrow oBB$

$B \rightarrow oS / IS / o$

Test whether $0 \mid 0^4$ is accepted by the PDA

b) Construct a CFG which accepts N (A) and simplify the same where [8+8]

A = $(\{q_0, q_1\}, \{a, b\}, \{Z_0, Z\}, \delta, q_0, Z_0, \phi)$ where δ is given by

$\delta(\{q_0, b.Z_0) = \{q_0, ZZ_0\}$

$\delta(q_0, \varepsilon, Z_0) = \{q_0, \in\}$

$\delta(q_0, b, z) = \{q_0, ZZ\}$

$\delta(q_0, a, Z) = \{q_1, Z\}$

$\partial(q_1, b, z) = \{q_1, \in\}$

$\partial(q_1, a, Z_0) = \{q_0, Z_0\}$

5.a) Design a turing Machine for the following language.

$L = \{ww^R \mid W \in (a \mid b)^*\}$

b) Discuss the types of tuning machines. [8+8]

6.a) Explain the Chomsky Hierarchy of languages

b) What is post correspondence problem? Is there any solution for the following PCP problem? If so give the solutions if not discuss why. [8+8]

	LIST A	LIST B
i	w_i	x_i
1 2 3	00 001 1000	0 11 011

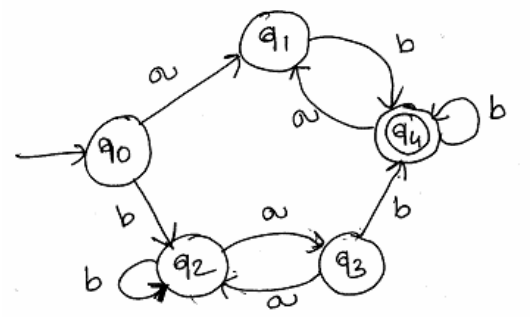
7.a) Show that for every NFA there exists an equivalent DFA.

b) Design DFA to accept strings of 0^1s and 1^1s such that strings end with 1110. [8+8]

8.a) Convert the Mealy machine into equivalent moore machine as shown in the table

Present state	Next State			
	a=0		a=1	
	State	Output	State	Output
q_0	q_0	0	q_1	1
q_1	q_2	1	q_0	0
q_2	q_1	2	q_2	2

b) Minimize the following finite automata and show both given and reduced are equivalent. [8+8]



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Code.No: NR-RR310504 | NR/RR | SET-3

III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
THEORY OF COMPUTATION
(COMMON TO CSE, CSS, CSIT)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks

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1.a) Convert the following grammer to GNF.

$A_1 \rightarrow A_2 A_3$

$A_2 \rightarrow A_3 A_1 \mid b$

$A_3 \rightarrow A_1, A_2 \mid a$

b) Prove that $L = \{a^n b^n / n \geq 1\}$ not context – free language. [8+8]

2.a) Design PDA accepting L by empty stack equivalent to the following CFG.

$S \rightarrow oBB$

$B \rightarrow oS / IS / o$

Test whether $0 \mid 0^4$ is accepted by the PDA

b) Construct a CFG which accepts N (A) and simplify the same where [8+8]

A = $(\{q_0, q_1\}, \{a, b\}, \{Z_0, Z\}, \delta, q_0, Z_0, \phi)$ where δ is given by

$\delta(\{q_0, b.Z_0) = \{q_0, ZZ_0\}$

$\delta(q_0, \varepsilon, Z_0) = \{q_0, \in\}$

$\delta(q_0, b, z) = \{q_0, ZZ\}$

$\delta(q_0, a, Z) = \{q_1, Z\}$

$\partial(q_1, b, z) = \{q_1, \in\}$

$\partial(q_1, a, Z_0) = \{q_0, Z_0\}$

3.a) Design a turing Machine for the following language.

$L = \{ww^R \mid W \in (a \mid b)^*\}$

b) Discuss the types of tuning machines. [8+8]

4.a) Explain the Chomsky Hierarchy of languages

b) What is post correspondence problem? Is there any solution for the following PCP problem? If so give the solutions if not discuss why. [8+8]

	LIST A	LIST B
i	w_i	x_i
1	00	0
2	001	11
3	1000	011

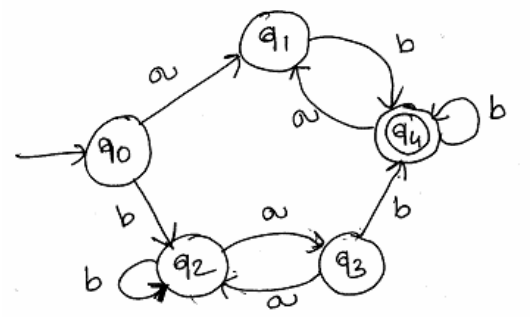
5.a) Show that for every NFA there exists an equivalent DFA.

b) Design DFA to accept strings of 0^1s and 1^1s such that strings end with 1110. [8+8]

6.a) Convert the Mealy machine into equivalent moore machine as shown in the table

Present state	Next State			
	a=0		a=1	
	State	Output	State	Output
q_0	q_0	0	q_1	1
q_1	q_2	1	q_0	0
q_2	q_1	2	q_2	2

b) Minimize the following finite automata and show both given and reduced are equivalent. [8+8]



7. Construct NFA for the following regular expressions.
   e) 0 + 10* + 01*0
   f) (0 +1)* (01 + 110) [8+8]

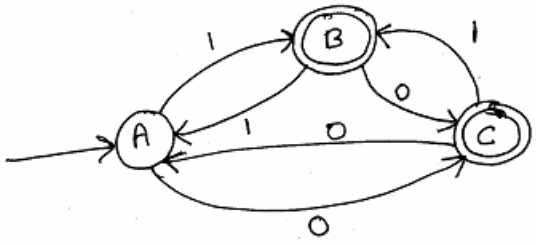
8.a) What is the languge generated by the CFG.

$S \rightarrow asb \mid aAb \mid aBb$

$A \rightarrow aA \mid a$

$B \rightarrow Bb \mid b$

b) Obtain a right linear and left – linear grammer for the following FA. [8+8]



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Code.No: NR-RR310504 | NR/RR | SET-4

III B.TECH – I SEM EXAMINATIONS, NOVEMBER - 2010
THEORY OF COMPUTATION
(COMMON TO CSE, CSS, CSIT)

Time: 3hours **Max.Marks:80**

Answer any FIVE questions
All questions carry equal marks
- - -

1.a) Design a turing Machine for the following language.
$L = \{ww^R \mid W \in (a \mid b)^*\}$
b) Discuss the types of tuning machines. [8+8]

2.a) Explain the Chomsky Hierarchy of languages
b) What is post correspondence problem? Is there any solution for the following PCP problem? If so give the solutions if not discuss why. [8+8]

	LIST A	LIST B
i	w_i	x_i
1 2 3	00 001 1000	0 11 011

3.a) Show that for every NFA there exists an equivalent DFA.
b) Design DFA to accept strings of 0^1s and 1^1s such that strings end with 1110. [8+8]

4.a) Convert the Mealy machine into equivalent moore machine as shown in the table

Present state	Next State			
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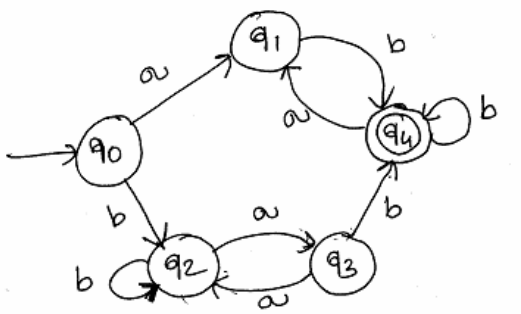
b) Minimize the following finite automata and show both given and reduced are equivalent. [8+8]



5. Construct NFA for the following regular expressions.
   g) 0 + 10* + 01*0
   h) (0 +1)* (01 + 110) [8+8]

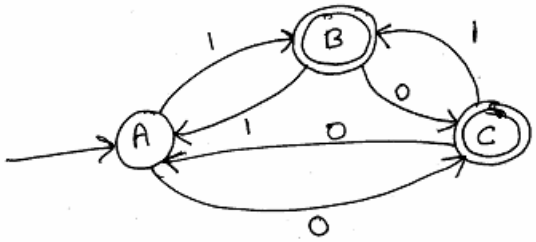
6.a) What is the languge generated by the CFG.

$S \rightarrow asb \mid aAb \mid aBb$

$A \rightarrow aA \mid a$

$B \rightarrow Bb \mid b$

b) Obtain a right linear and left – linear grammer for the following FA. [8+8]



7.a) Convert the following grammer to GNF.

$A_1 \rightarrow A_2 A_3$

$A_2 \rightarrow A_3 A_1 \mid b$

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b) Construct a CFG which accepts N (A) and simplify the same where [8+8]

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$\delta(q_0, b, z) = \{q_0, ZZ\}$

$\delta(q_0, a, Z) = \{q_1, Z\}$

$\partial(q_1, b, z) = \{q_1, \in\}$

$\partial(q_1, a, Z_0) = \{q_0, Z_0\}$

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