4   <u>mark</u>

1. Construct a r.e for the language which accepts all strings with atleast two c's over the set =\{c,b\}
2. Construct a r.e for the language over the set =\{a,b\} in which total number of a's are divisible by 3
3. Construct NFA equivalent to the regular expression (0+1)01
4. Differentiate L* and L+
5. Construct a CFG for the set of strings that contain equal number of a's and b's over =\{a,b\}.
6. Let G be the grammar with

   S-> aB/bA

   A->a/aS/bAA

   B->b/bS/aBB

   For the string aaabbabbba, find the leftmost derivation.
7. What are useless symbols in a grammar?
8. Explain Chomsky Normal Form.
9. What do you mean by null production and unit production? Give an example.
10. Construct the context free grammar representing the set of palindromes over (0+1)*.
11. Write the CFG for the language L = \{$a^n b^n$ | n   1\}
12. If S   aSb | aAb , A   bAa , A   ba .Find out the CFL.

<u>12 mark</u>

1. What is a ambiguous grammar?.Consider the grammar
   P=\{S->aS | aSbS | \} is ambiguous by constructing:
   two parse trees (b) two leftmost derivation (c) two rightmost derivation
2. Eliminate unit production in the given grammar
   S   aAa/bBb/
   A   C/a
   B   C/b
   C   CDE/
   D   A/B/ab
3. Construct a CFG for the language L = $a^n b^{2n}$ where n>=1,over   =\{a,b\}
4. Eliminate   production from the grammar

   > S->aA|aBB
   > A->aaA|
   > B->bB|bbC
   > C->B

5.

For the grammar G defined by the production.

$S \rightarrow A \mid B$

$A \rightarrow OA \mid \varepsilon$

$B \rightarrow OB \mid 1B \mid \varepsilon$

Find the parse tree for yields (i) 1001 (ii) 00101

6. Eliminate useless symbols in the following grammar

$$S \quad aAa|aB$$
$$A \quad aS \mid bD$$
$$B \quad aBa|b$$
$$C \quad abb \mid DD$$
$$D \quad aDA$$

7. Convert the following grammar into CNF

$$S \quad 0A0|1B1|BB$$
$$A \quad C$$
$$B \quad S|A$$
$$C \quad S|$$

8. Convert the following grammar into GNF

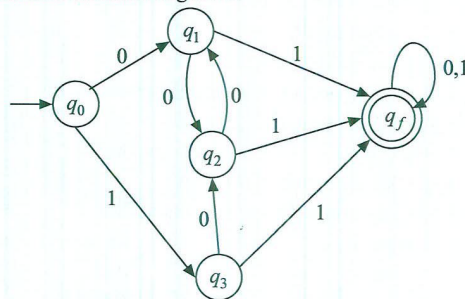$$A_1 \quad A_2A_3$$
$$A_2 \quad A_3A_1|b$$
$$A_3 \quad A_1A_2|a$$

9. Explain about the types of grammar and the machine which accepts each type of grammar.

10. Construct the regular expression for the given finite Automata .
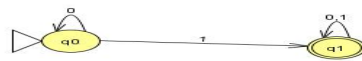
11.

Minimize the following DFA.

Show that L={a^n|n is prime} is not regular.

12. convert the RE (a/b)*abb into epsilon-NFA and find its equivalent DFA.

13. Give the formal definition of mealy machine with an example.

14. State pumping lemma for regular sets and show that L={$a^i b^j$|i>j where i,j>=1} is not regular.

15. Construct a regular expression given in the following state diagram.