OR

E4 : [Theory of Computation]

Group - A

Answer any *six* questions : 2×6=12

1. (a) What is derivation tree?

   (b) Define Turing Machine.

   (c) If G is $S \rightarrow aS \mid bS \mid a \mid b$, then find L(G).

   (d) Differentiate between DFA and NFA.

   (e) Find the regular expression for the set of all strings containing exactly 2a's, where $\Sigma = \{a, b\}$.

   (f) Construct a DFA that ends with AB, where $\Sigma = \{A, B\}$.

   (g) Differentiate between regular grammar and context free grammar.

Group - B

Answer any *four* questions. 5×4=20

2. State Chomsky classification of languages with example.

3. Construct a grammar G generating $\{a^n b^n c^n \mid n \geq 1\}$.

4. Construct a Mealy machine which can output EVEN,

ODD according as the total number of 1's encountered is even or odd. The input symbols are 0 and 1.

5. Design a Turing machine to recognize all strings consisting of an even number of 1's.

6. Illustrate the algorithm to construct a minimum automaton.
