

[Time:2.30 Hrs]

[ Marks:75 ]

Please check whether you have got the right question paper.

- N.B:
1. All question are compulsory.
  2. Figures to the right indicate full marks.

**Q.1 Attempt any four of the following.****20**

- A Write a note on Classification of Grammar.
- B Construct a DFA accepting all strings over  $\{a, b\}$  ending in  $ab$ .
- C Explain the process of construction of minimum automation. Give Suitable example
- D Construct a finite automation equivalent to  $(0+1)^* (00^*11)(0+1)^*$
- E With example compare between deterministic and non-deterministic finite automation.
- F Write a note on operation on Languages.

**Q.2 Attempt any four of the following.****20**

- A State and prove Arden's theorem.
- B State and prove pumping lemma for regular set.
- C Prove that  $(a+b)^* = a^*(ba^*)^*$ .
- D Write a note on Chomsky Normal Form.
- E Explain with suitable example the leftmost derivation and rightmost derivation.
- F Draw Derivation Tree for a substring "001100".

**Q.3 Attempt any four of the following.****20**

- A Briefly explain the Structure and operation of push down automata.
- B Write a note on nondeterministic Turing machine
- C Write note on Halting Problem.
- D Define the Church-Turing thesis.
- E What type of language or grammar is accepted by Turing machine?
- F Describe Turing Machine representation.

**Q.4 Attempt any three of the following.****15**

- A Construct TM to accept the language  $0^* 1^*$
- B Which type of language is accepted by Linear Bound Automata?
- C Justify. Is the language accepted by LBA is accept by Turing Machine.
- D Differentiate between FA and PDA.
- E Find the Context Free Language (CFL) associated with the CFG.  
 $S \rightarrow aB \mid bA$   
 $A \rightarrow a \mid aS \mid bAA$   
 $B \rightarrow b \mid bS \mid aBB$
- F Compare Melay and Moore models.

\*\*\*\*\*THE END\*\*\*\*\*