

2018

Full Marks - 40

Time - 3 hours

The figures in the right-hand margin indicate marks

Answer *all* questions.

1. a) Design NFA which accepts Set of all strings containing three consecutive zeros. Also corresponding DFA. 5
- b) Convert the r.e.r =  $(10 + 0)^* (00 + 1)^*$  to NFA with E transaction. 5

OR

- c) Design DFA which accepts 1100 or 1010 only. 5
- d) Define Moore and Mealy machine. For the given transition table draw transition diagram of Moore. 5

| State | input |       | output |
|-------|-------|-------|--------|
| $q_0$ | 0     | 1     | 0      |
|       | $q_0$ | $q_1$ |        |
| $q_1$ | $q_0$ | $q_2$ | 0      |
| $q_2$ | $q_0$ | $q_2$ | 1      |

[ 2 ]

2. For the given Context Free grammar G defined by

$S \rightarrow AB/BC$

$A \rightarrow BB/0$

$B \rightarrow BA/1$

$C \rightarrow AC/AA/0$

Check whether the string 11010 belongs to G or not by using Cocke Younger Kasami (CYK) algorithm. 10

OR

Write short notes on the followings : 5 + 5

a) Pumping Lemma for regular set

d) Turing machine to add two numbers.

3. Draw a Push down automata with minimum number of Pushdown Store of the language

$\{WCW^R \mid W \in \{0, 1^*\}\}$ . Here  $W^R$  is reverse string of W. 10

OR

Write short notes on the followings : 5 + 5

a) Chomsky normal forms

b) Equivalence of CFL and PDA

[ 3 ]

4. Write short notes on any *four* the followings :  $2\frac{1}{2} \times 4$

a) L-system of grammar

b) Partial recursive Function

c) Unsolvability Class of Problems

d) Halting Problem

e) Design of Turing Machine.

L-419-06

