

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
(Summer Examination June-2018)

3rd Year

COURSE CODE: 10B11CI513

MAX. MARKS: 50

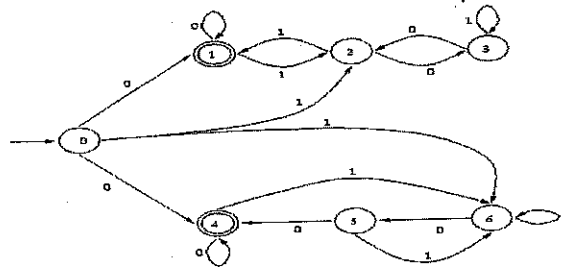
COURSE NAME: Theory of Computation

MAX. TIME: 2 Hrs

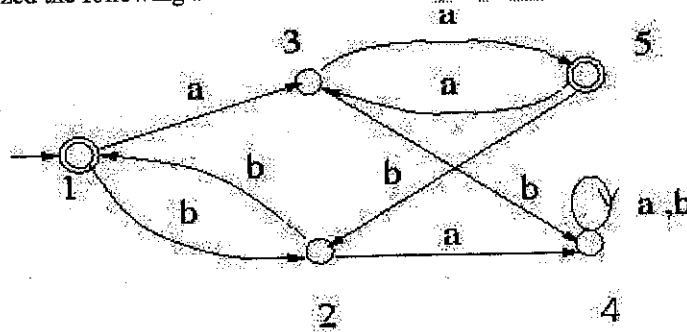
Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q.1 a. Convert the following NFA to equivalent DFA.

(4+6)



b. Minimized the following automata.



Q.2 a. Write the regular expression for the language

(6+4+4)

- 1) All strings that do not end with aa.
- 2) All strings which do not contain the substring ba.
- 3) All Strings do not end with bb.

b. Design a automata which is divisible by 7.

c. Design the automata for corresponding regular expressions.

- 1) $ab(aa+bb)^*b^*+ab$
- 2) $(ca+b)^*(bb^*)(a+b)$

Q.3 a. Convert the following grammar into CNF.

(6+4+4)

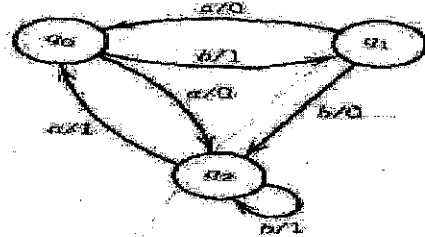
- 1) $S \rightarrow Aa \mid bAc \mid dc \mid bda$ $A \rightarrow d$
- 2) $S \rightarrow 1A \mid 0B$, $A \rightarrow 1AA \mid 0S \mid 0$, $B \rightarrow 0BB \mid 1S \mid 1$
- 3) $S \rightarrow aB \mid ab$, $A \rightarrow aAB \mid a$, $B \rightarrow ABb \mid b$

b. Convert the following grammar in GNF.

- 1) $S \rightarrow bS \mid BcA$ $A \rightarrow aA \mid BBa \mid c$ $B \rightarrow ba$
- 2) $S \rightarrow AS \mid AB$ $A \rightarrow BS \mid a$ $B \rightarrow AA \mid a$

Q.4 a. Design the Moore Machine for the given finite state machine.

(6+6)



b. Design the Mealy machine for the given finite state machine.

