S.Y.(Comp) ToC 5/3

Total No. of Questions – [6]   Total No. of Printed Pages: 01

G.R. No.	

MARCH 2020 INSEM (T1)
S. Y. B.TECH. (COMPUTER ENGINEERING) (SEMESTER –IV)

COURSE NAME: THEORY OF COMPUTATION
COURSE CODE: CSUA22184
(PATTERN 2018)

Time: [1 Hour]   [Max. Marks: 20]

Instructions to candidates:

1. Attempt Q.1 **OR** Q.2, Q.3 **OR** Q.4, Q.5 **OR** Q.6
2. Figures to the right indicate full marks.
3. Use of scientific calculator is allowed.
4. Assume suitable data wherever required.

Q. 1)   Define DFA and NFA with example   [4]
        Construct DFA over alphabets {a, b} for accepting the strings that   [4]
        start and end with same symbols

OR

Q. 2)   Construct a NFA for Σ= {a, b} which accepts words where third   [8]
        symbol from RHS is 'a' .Convert this NFA to DFA

Q. 3)   Write regular expressions for following languages and construct   [8]
        its equivalent NFA:
        L_1= set of all strings with substring '000' $\Sigma=\{0,1\}$
        L_2= set of all strings whose length is multiple of three. $\Sigma=\{a, b\}$

OR

Q. 4)   State the closure properties of Regular Languages and using   [8]
        pumping lemma for regular language prove $L = \{ a^n b^n | n>=1\}$ is
        not a regular language

Q. 5)   Write grammar for following languages: [4]
        L_1= { $a^n b^n c^m$ |n, m>=0 }
        $L_2 = (a + b)^*$

OR

Q. 6)   Show that following grammar is ambiguous: [4]
        E -> E*E | E+E | id , where E is start symbol and id, +, * are
        terminal symbols