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SIXTH SEMESTER   B.Tech[MC]

MID SEMESTER EXAMINATION   *March-2019*

MC304   THEORY OF COMPUTATION

Time: 1:30 Hours   Max. Marks : 25

Note :Answer all questions.Assume suitable missing data, if any.

Q.1 [a]Choose the correct answer. Justify   (3)

i. Which of the following is a regular expression for binary strings
    with no consecutive 1's ?
      a) $(01 + 10)^*$
      b) $(1 +\wedge)(01 + 0)^*$
      c) $(0 + 1)^*(0 +\wedge)$
      d) $(10 + 0)^*(1 +\wedge)^*$

ii. Which of the following is the language of the grammar:
      S →bS|aA|b ; A→bA|aB ; B →bB|aS|a
      a) Number of a's is more than three times the number of b's.
      b) Number of b's is more than three times the number of a's.
      c) Number of a's is multiple of 3.
      d) Number of b's is multiple of 3.

iii. The smallest finite automata that accepts all non-negative binary
     numbers divisible by 3 has:
       a) 2 states
       b) 3 states
       c) 4 states
       d) 5 states

[b] What is the length of output string if the length of input string is
    n, in case of Mealy and Moore machine.Explain.   (2)

                                                          P.T.O.

Q.2 [a] Construct a minimum state automata equivalent to the transition
diagram below: (5)
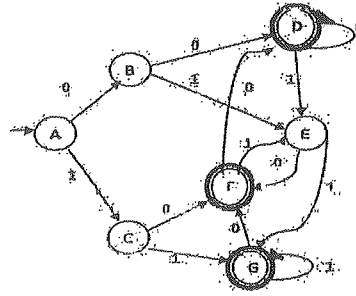
[b] Construct a Finite Automata that accept the set of all inputs that
are binary numbers divisible by 4 or by 6.   (5)

Q.3 [a] Show that all the language under Chomsky classification are
closed under concatenation.   (4)

[b] If R is a regular expression over $\sum$ representing $L \subset \Sigma^*$,
construct an NDFA M with Λ-moves such that L= T(M), where
last operator in R is concatenation.   (3)

[c] Find the regular expression corresponding to the automata given
below:

                                                                  (3)

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