UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 5th Semester Examination, 2020

CC12-COMPUTER SCIENCE

THEORY OF COMPUTATION

Full Marks: 60

ASSIGNMENT

The figures in the margin indicate full marks.
All symbols are of usual significance.

Answer any *three* questions 20×3 = 60

1. Define NFA and DFA. Draw a NFA and DFA which accept the string 00 or 11 at the end of a string over the alphabet $\sum = \{0,1\}$. For example, the string 01010100 is accepted but not 000111010. 20

2. Define regular expression. Construct DFA for the following regular expression 10 + (0+11)0*1. 20

3. (a) Define alphabet, string, language and Kleene Star with example. 10

   (b) Write regular expression over the alphabet $\{0,1\}$ to denote a language L which accept all the strings which begin or end with either 00 or 11. Also, Draw the NFA for the language L. 10

4. Define grammer. For the grammar $G = \{S \to AaS \mid a,\ A \to SbA \mid SS \mid ba\}$, find the leftmost and rightmost derivation for the string aabbaaa. 20

5. (a) Define ambiguous grammar. Using parse tree show that the grammar $S \to S + S \mid S * S \mid a$ is ambiguous. 10

   (b) Convert the following Regular expression into. $FA: (a+b)*aba(a+b)*$ 10

6. Define: 20

   (a) Finite Automata

   (b) Regular Language

   (c) Context free Language

   (d) Transition Graphs.

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