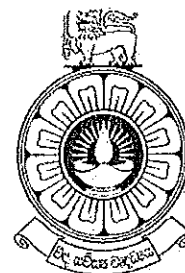


THE OPEN UNIVERSITY OF SRI LANKA
 B.Sc. DEGREE PROGRAMME: LEVEL 05
 DEPARTMENT OF COMPUTER SCIENCE
 CSU5305 – THEORY OF COMPUTING
 NO BOOK TEST 1(NBT-1) – 2017/2018
 DURATION: One Hour only



Date: 31.12.2018

Time: 4.15pm – 5.15pm

Answer All Questions.

1. Write short answers for the following questions given below.
 - i. Define the words: “Alphabet”, “Strings” and a “Language” and write a relationship between Strings and language.
 - ii. Write the difference between Positive Closure and the Kleene Closure of a Language L.
 - iii. Two relations are given by $R_1 = \{(1, \epsilon), (10, 1)\}$ and $R_2 = \{(0, 1), (0, 10)\}$
 Find,
 - a) $R_1 \cup R_2$
 - b) $R_1 R_2$
 - iv. What is a “Formal Language”?
 - v. Write any string that you like and find the substring, the prefix and the suffix of the string.
 - vi. A grammar G is a quadruple of variables. Write the variables of G and the corresponding names.
 - vii. How many grammar types are there in Chomsky Hierarchy of grammars? Write their names in the ascending order.
 - viii. Draw a diagram showing the types of grammar you mentioned in your answer to part (vii).
 - ix. What is meant by a “Regular Language”?
 - x. A language L is generated as $a(a^*U b^*)b$. Write the grammar rules for the language L.
2. Write the corresponding regular languages for the regular expressions given below.
 - i. $(a+b)^*$
 - ii. $(aa)^*(bb)^*b$

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