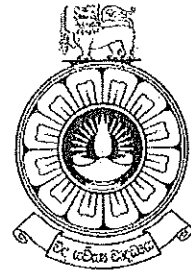


THE OPEN UNIVERSITY OF SRI LANKA  
 B.Sc. DEGREE PROGRAMME: LEVEL 05  
 DEPARTMENT OF COMPUTER SCIENCE  
 CSU5305 – THEORY OF COMPUTING  
 NO BOOK TEST 2(NBT-2) – 2017/2018  
 DURATION: One Hour only



Date: 28.01.2019

Time: 4.15pm – 5.15pm

Answer All Questions.

1.

- i. Write the names of Chomsky Hierarchy of grammars.
- ii. Using your answer to part (i), name the grammar type given below.  
 $G = \langle N, \Sigma, P, S \rangle$   
 $N = \{S\}$   
 $\Sigma = \{a, b\}$   
 $P = \{S \rightarrow aSb, S \rightarrow \epsilon\}$
- iii. Using the information given in part (ii), obtain a sentence in the language generated by  $G$  and the sentential form.

2.

- i. Give the definitions of a State Transition System (STS) and a Labeled Transition System (LTS).
- ii. A Transition System can be represented by several ways. One way is by a Transition Function. Give the names of the other two ways.
- iii. Consider the Transition System that has states  $q_1, q_2$  and  $q_3$ . Input  $\{0, 1\}$ .  
 The Transition Functions are given below.

$$\delta(q_1, 0) \rightarrow q_1$$

$$\delta(q_1, 1) \rightarrow q_2$$

$$\delta(q_2, 0) \rightarrow q_3$$

$$\delta(q_2, 1) \rightarrow q_2$$

$$\delta(q_3, 0) \rightarrow q_2$$

$$\delta(q_3, 1) \rightarrow q_2$$

According to the names given by you as answer to part 2 (ii), draw the two diagrams.

