**SVKM’S NMIMS, School of Technology Management & Engineering | Navi-Mumbai**

**B-Tech (A.Y. 2020-21)**

**Term Work 3 (a)**

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| **Course: BTech (COMPUTER Sc. And Business Systems)** | **SEM: III** |
| **Subject: Formal Language and Automata Theory** | **Marks: 5** |
| **Date of Exam: 09.09.2020** | **Duration: 1 Hour** |

***Instruction to students:***

**1.** Answer all questions.

**2.** Figures in brackets on the right hand side indicate full marks.

Q.1). Consider the grammar *G* = {(*S*, *A*), (0, 1), *P*, *S*}, where *P* consists of: [1 mark]

*S* 🡺 0 *A S* | 0

*A* 🡺 *S* 1 *A* | *S S* | 1 0

Show the leftmost derivation and rightmost derivation for the input string ‘001100’.

Q.2). Show that the following CFG is ambiguous. Remove the ambiguity and write an equivalent unambiguous CFG.

*S* 🡺 *S* + *S* | *S* \* *S* | 4 [1 mark]

Q.3).Remove the unit productions from the following CFG. [1 mark]

*S 🡺* *a X* | *Y b*

*X 🡺* *S*

*Y 🡺* *b Y* | *b*

Q.4). Give the regular expression for the language generated by the following grammar: [1 mark]

*S 🡺* *A* | *B*; *A 🡺* 0 *A* | €; *B* 🡺 0*B* | *B* | €

Q.5).Construct the right-linear grammar corresponding to the regular expression: [1 mark]

*R* = (0 + 1)\* (1 + (01)\*)