Dr Hemi Sgh

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-2 EXAMINATION- October, 2018

M. Tech III Semester

COURSE CODE: 15M1WCI331 MAX. MARKS: 25

COURSE NAME: Advanced Theory of Computation

COURSE CREDITS: 3 MAX. TIME: 90 Minutes

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

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1. Convert to Greibach Normal Form the grammar G=({A1, A2, A3}, {a, b}, P, A1), where P consists of the following: (CO2)

   $A_1 \longrightarrow A_2A_3$

   $A_2 \longrightarrow A_3A_1 \mid b$

   $A_3 \longrightarrow A_1A_2 \mid a$ **[6 marks]**

2. Convert Context Free Grammar (CFG) to Pushdown Automata (PDA). (CO2)

   $S \longrightarrow 0BB$

   $B \longrightarrow 0S \mid 1S \mid 0$

   Test for string 010^4, where 0 and 1 are terminal symbols. **[6 marks]** (CO3)

3. Design a Turing Machine (TM) M to accept the language $L = \{0^n1^n \mid n>=1\}$ **[6 marks]**

4. Design a Turing Machine (TM) M to implement the total recursive function "multiplication". (CO4)

   [7 marks]