Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov/Dec – 2017**

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| **Code :** | **14CS2047** | **Duration :** | **3hrs** |
| **Sub. Name :** | **THEORY OF COMPUTATION** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Find the DFA for the languages   1. L1 = { w : w ends with aab and w ɛ {a, b}\*} 2. L2 = { w1abw2: w1 ɛ {a, b}\* and w2 ɛ {a, b}\*} | CO1 | 10 |
| b. | Draw NFA for   1. L((0+1)\*011) 2. L((a+b)(ab)\*) | CO1 | 10 |
| (OR) | | | | |
| 2. |  | Convert the following NFA into DFA and minimize it. | CO1 | 20 |
| 3. | a. | Find the regular expression for the following NFA | CO1 | 10 |
|  | b. | Construct right linear and left linear for the following language:  L(aa\*(ab+a)\*) | CO1 | 10 |
| (OR) | | | | |
| 4. | a. | Find the DFA that accepts L= L(ab\*a\*) U ((ab)\*ba) | CO2 | 10 |
|  | b. | Write the Context Free Grammar for the language L = {anbnc mdm : n ≥ 0, m ≥ 1 } | CO2 | 5 |
|  | c. | Show that the following grammar is ambiguous:  S → aSbS| bSaS| λ | CO2 | 5 |
| 5. |  | Convert the following grammar into Chomsky’s and Greibach’s Normal Form  S →ASB | λ  A → aAS | a  B → SbSb | A | bb | CO2 | 20 |
| (OR) | | | | |
| 6. | a. | Use CYK membership algorithm to find whether “acac” is a member of the language represented by the grammar.  S → XY | XZ  X → YZ | a  Y → XZ | b  Z → c | CO2 | 10 |
|  | b. | Construct NPDA for the following grammar and find whether “aabbbc” is accepted by the NPDA  S → aA  A → aABC | bB |a  B → b  C → c | CO3 | 10 |
| 7. |  | Construct NPDA for the following languages   1. L1= {w: na(w)-2 = nb(w) } 2. L2 = { a2nbn : n ≥ 1} | CO3 | 20 |
| (OR) | | | | |
| 8. |  | Construct DPDA for L = {anbn : n ≥ 1} U {b} | CO3 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Construct the turning machine for the following languages:   1. L1 = {w: |w| is even} 2. L2 = L((ab)\*) | CO3 | 10 |
|  | b. | Briefly discuss about the variants of the Turing Machines. | CO3 | 10 |

ALL THE BEST