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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – April / May – 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 language L = { w : |w| mod 4 ≠ 0 and w ɛ {a, b}\*} | CO1 | 10 |
| b. | Draw NFA for   1. L((aa)\*b) 2. L((00+1)\*) | 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, left linear and s- grammar for the following language.  L(aa\*b+b) | CO1 | 10 |
| (OR) | | | | | (OR) |
| 4. | a. | Find the right quotient for L1 = L(a\*baa\*) and L2 = L(aba\*) | CO2 | 10 |
|  | b. | Write the CFG for L = { anbm : n ≤ m+3} | CO2 | 5 |
|  | c. | Show that the following grammar is ambiguous  E → E+E | E\*E | (E) | a | CO2 | 5 |
| 5. |  | Convert the following grammar into Chomsky’s and Greibach’s Normal Form  S → aA | aBB  A → aaA | λ  B → bB | bbC  C → B | CO2 | 20 |
| (OR) | | | | |
| 6. | a. | Use CYK membership algorithm to find whether “abbab” is a member of the language represented by the grammar.  S → AB  A → BB | a  B → AB | b | CO2 | 10 |

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|  | b. | Construct NPDA for the following grammar and find whether “aaabc” 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= {anbn : n ≥ 0} 2. L2 = { na(w) = nb(w)+1 : w ɛ {a,b}\*} | CO3 | 20 |
| (OR) | | | | |
| 8. |  | Construct the DPDA for the language {wcwr : w ɛ {a,b}\*} | CO3 | 20 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Construct the turing machine for the language L{0m12m : m ≥ 1} | CO3 | 10 |
|  | b. | Write a brief note on Chomsky’s Hierarchy. | CO3 | 10 |