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 – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **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 = { ab3wb2 : w ɛ {a, b}\*} | CO1 | **10** |
| b. | | Draw NFA for   1. L((a+ab)a\*) 2. L(0\*1\*(0+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((aab\*ab)\*) | CO1 | **10** |
| **(OR)** | | | | | |
| 4. | | a. | Find L1/L2 for the following languages L1 = L(a\*baa\*) and L2 = L (ab\*) | CO2 | **10** |
|  | | b. | Write the Context Free Grammar for the language L = {anbn+2 : n ≥ 0} | CO2 | **5** |
|  | | c. | Show that the following grammar is ambiguous  S → SS | aSb | bSa | λ | CO2 | **5** |
| 5. | |  | Convert the following grammar into Chomsky’s and Greibach’s Normal Form  S → a | aA | B | C  A → aB | λ  B → Aa  C → cCD  D → ddd | CO2 | **20** |
| **(OR)** | | | | | |
| 6. | | a. | Use CYK membership algorithm to find whether “abaa” is a member of the language represented by the grammar.  S → AS | a  A → AB | a  B → BA | b | CO2 | **10** |
|  | | b. | Construct NPDA for the following grammar and find whether “aaabb” is accepted by the NPDA  S → aABB | aAA  A → aBB | a  B → bBB | b | CO3 | **10** |
| 7. | |  | Construct NPDA for the following languages   1. L1= {wcwr : w ɛ {a,b}\* } 2. L2 = { anbmcn+m : n ≥ 1; m ≥ 1} | CO3 | **20** |
| **(OR)** | | | | | |
| 8. | |  | Construct DPDA for L = {anbn : n ≥ 1} U {a} | CO3 | **20** |
|  | | | **Compulsory:** |  |  |
| 9. | | a. | Construct the turing machine for the following languages   1. L1(aba\*b) 2. L2((ab)\*) | CO3 | **10** |
|  | | b. | Briefly discuss about the variants of the Turing Machines. | CO3 | **10** |

ALL THE BEST