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



**End Semester Examination – Nov / Dec – 2019**

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

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Construct the DFA for the following languages L1={(a+b)\*a}  L2={w: wε{0,1}\* and |w| is odd} | CO1 | 10 |
| b. | Convert the NFA to DFA.  C:\Users\Salaja\AppData\Local\Microsoft\Windows\INetCache\Content.MSO\4EF5AA3E.tmp | CO2 | 10 |
| (OR) | | | | |
| 2. | a. | Minimize the DFA | CO2 | 10 |
| b. | Construct NFA for the following languages  L1={(a(a+ab)\*)}  L2={(01)\*0} | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | Construct Regular Expression for the given finite automata. (q0 and q3 are final states) | CO2 | 10 |
|  | b. | Outline the algorithm for converting finite automata to regular expression. | CO1 | 10 |
| (OR) | | | | |
| 4. | a. | Construct Right Linear and Left Linear Grammar for the language represented by the following Finite Automata:  Image result for finite automata to left linear grammar | CO2 | 10 |
|  | b. | Given regular languages L1(aba\*) and L2(aba). Find the following   1. Union 2. Intersection 3. Right Quotient | CO1 | 10 |
|  |  |  |  |  |
| 5. | a. | Construct CFG for the languages  L1= {anbncm: n≥0, m≥1}  L2={wcwR: wɛ{a,b}\*} | CO1 | 10 |
|  | b. | Construct leftmost derivation, rightmost derivation and parse tree for the string “a+a\*a” using the following grammar and also show that the following grammar is ambiguous  E → E+E | E\*E | (E) | a | CO1 | 10 |
| (OR) | | | | |
| 6. | a. | Convert the following grammar into Chomsky’s and Greibach Normal Forms  S →ASB | b  A → aAS | a  B → SbSb | A | bb | CO2 | 10 |
|  | b. | Check the membership of the string “acac” for the following grammar.  S → XY | XZ  X → YZ | a  Y → XZ | b  Z → c | CO3 | 10 |
|  |  |  |  |  |
| 7. | a. | 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 | CO2 | 10 |
|  | b. | Construct NPDA for the following language  L1= {0n1n+2: n≥0} | CO2 | 10 |
| (OR) | | | | |
| 8. | a. | Construct DPDA for L = {anbn : n ≥ 0} | CO2 | 10 |
|  | b. | Design a turing machine for the languages  L1(a(a+b)a\*)  L2((011)\*) | CO1 | 10 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Briefly discuss about the variants of the Turing Machines. | CO3 | 10 |
|  | b. | Discuss Chomsky’s hierarchy. | CO3 | 10 |