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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

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

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Sub. Code :** | **09CS214 / 12CS213 / CS233** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **PRINCIPLES OF COMPILER DESIGN** | **Max. marks :** | **100** |

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| **Q. No.** | | **Questions** | | **Marks** |
| **PART-A(10X1=10 MARKS)** | | | | |
| 1. | | Differentiate Compiler and Interpreter. | | (1) |
| 2. | | Generate four possible strings for the regular expression: (a|b)\*(cd)\*. | | (1) |
| 3. | | Form a regular expression for all the strings which start with at most one digit followed by any alphabet. | | (1) |
| 4. | | Which predefined variable of LEX contains the matching string? | | (1) |
| 5. | | Define a context free grammar. | | (1) |
| 6. | | What are the problems in shift reduce parsing? | | (1) |
| 7. | | What are the various types of intermediate code representation? | | (1) |
| 8. | | Define lifetime of an activation record. | | (1) |
| 9. | | What is a flow graph? | | (1) |
| 10. | | Define a basic block. | | (1) |
| **PART B(5 X 3= 15 MARKS)** | | | | |
| 11. | | What are the phases that constitute the front end of a compiler? | | (3) |
| 12. | | Write the pseudo code for simulating the Deterministic Finite Automata. | | (3) |
| 13. | | Why left recursion has to be eliminated from the grammar? | | (3) |
| 14. | | Give the syntax-directed definition for if-else statement to perform type checking. | | (3) |
| 15. | | List the various types of data structure used to store the symbol table. | | (3) |
| **PART C(5 X 15= 75 MARKS)** | | | | |
| 16. |  | | Describe the various phases of a compiler in detail. Trace the output of each phase for theprogram segment position: = initial+ rate\*60 where rate is real data type. | (15) |
| (OR) | | | | |
| 17. | a. | | Explain the language processing system with necessary block diagram. | (8) |
| b. | | What is an ambiguous grammar? Is the following grammar ambiguous? Prove. E → E + E | E \* E | (E) | id | (7) |
| 18. | a. | | Discuss the issues involved in designing Lexical Analyzer. | (7) |
| b. | | Draw NFA for the regular expression (01)\*(0|1) using Thompson’s construction. | (8) |
| (OR) | | | | |
| 19. |  | | Convert the NFA obtained by the regular expression (0|1)\*011 to DFA and minimize it. | (15) |
| 20. |  | | Construct the predictive parsing table for the following grammar and parse “not ( 0 and 1)” .  E -> E or T | T  T -> T and F | F  F -> not F | (E) | 0 | 1 | (15) |
| (OR) | | | | |
| 21. |  | | Construct SLR parsing Table for the grammar and parse “bb” .  S -> CC  C ->aC | b | (15) |
| 22. |  | | Write code to generate three address intermediate code for expression for statements. | (15) |
| (OR) | | | | |
| 23. |  | | Convert a= a\*(b\*-c)+(b\*-c)/d into three address code, quadruples, triples, indirect triples, syntax tree and DAG. | (15) |
| 24. | a. | | Explain briefly about the runtime storage environment. | (5) |
| b. | | Write down the issues involved in code generation. | (10) |
| (OR) | | | | |
| 25. |  | | Explain with an example about the optimization of basic blocks. | (15) |

ALL THE BEST