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 :** | **14CS2038** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PRINCIPLES OF COMPILER DESIGN** | **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. | Describe the phases of a compiler in detail. Indicate the functions and the type of errors detectable at each stage. | CO1 | 15 |
| b. | Outline the translation of the statement “ grade= mark / total \* 100 | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Describe the functionality of the various components in a language processing system. | CO1 | 10 |
| b. | Explain the front end and back end of a compiler | CO1 | 10 |
| 3. | a. | Construct a Minimum state DFA for the given regular expression.  (0|1)\*100 | CO2 | 14 |
|  | b. | Explain the use of the following function for the construction of DFA from regular expression.   1. Nullable 2. First Position 3. Last Position 4. Follow Position | CO2 | 6 |
| (OR) | | | | |
| 4. | a. | Write a LEX program to recognize the various tokens in the scanning phase of the compiler. | CO3 | 15 |
|  | b. | Explain the rules issued by LEX compiler to match the lexemes and tokens. | CO3 | 5 |
| 5. |  | Construct the LL(1) parsing table for the given grammar and parse the string “true and false or true”.  E 🡪E and T | T  T 🡪T or F | F  F 🡪 (E) | true | false  List the moves of the parser. | CO2 | 20 |
| (OR) | | | | |
| 6. |  | Is the following grammar SLR? Justify your answer.  S → XaY | Y  X → bY | c  Y → X  Elaborate the steps in construction of SLR parsing table and the parsing action. | CO2 | 20 |
| 7. |  | Construct CLR parsing table for the following grammar. Parse the string “dcb”.  S 🡪Aa | dAb | dca | cb  A 🡪 c  Write the parsing rules of CLR parser. | CO2 | 20 |
| (OR) | | | | |
| 8. | a. | Construct the following intermediate representations for the expression a = b + ( - c / d ) + ( - c / d )   1. Syntax tree 2. DAG | CO2 | 4 |
|  | b. | Write syntax directed translation schemes to translate the following statements to three address codes:   1. Assignment statement 2. Arithmetic expression 3. Relational expression 4. If – else statement   Using this, translate the following statement to three address code  If(a>b)  then c = a  else if (c>b)  then c = a+c | CO2 | 16 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Discuss the issues in the deign of a code generator in detail. Write the algorithm for a simple code generator. | CO2 | 10 |
|  | b. | Explain peephole optimization with suitable examples. | CO2 | 10 |

ALL THE BEST