10CS71 USN

# Seventh Semester B.E Degree Examination, Dec 2016/Jan2017
## Computer Science and Engineering
## Compiler Design (10CS71)

Time:3Hrs Max. Marks:100

*Instructions:* 1. Answer one full question from each unit.
2. Any missing Data can be suitably assumed.

| | | | | CO; BL |
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| | | **UNIT-I** | | |
| 1. | a. | Explain the various phase of compiler with the help of neat diagram. | 08 Marks | 1,2;L1 |
| | b. | State the rules for constructing FIRST and FOLLOW sets. | 06 Marks | 1,2;L2 |
| | c. | Write the transition diagram to recognize the tokens below.<br>i) relop (relational operator)<br>ii) Unsigned Numbers | 06 Marks | 1;L3 |
| 2. | a. | Define sentinels. Give look ahead code with sentinels. | 06 Marks | 1;L1 |
| | b. | With an example, explain the use and coordination between LEX and YACC the compiler writing tool | 06 Marks | 1;L2 |
| | c. | Explain how to handle reserved words and identifiers during reorganization of token. | 08 Marks | 1;L3 |
| | | **UNIT-II** | | |
| 3. | a. | Consider the grammar<br>S→ CC<br>C→cC<br>C→d<br>i) Construct canonical collection of LR (1) items and DFA<br>ii) Construct SLR(1) parsing table | 10 Marks | 2,3;L6 |
| | b. | For the grammar<br>E→ E+T\|T<br>T→ T*F\|F<br>F→ (E)\|id<br>i) Construct canonical collection of LR(0) items and DFA<br>ii) Construct LR(0) parsing table | 10 Marks | 2,3;L6 |
| 4. | a. | Eliminate left factors for the following grammar<br>S→iCts/iCtSeS/b<br>C→d | 05 Marks | 2,3;L3 |
| | b. | Explain the working principle of LR parsers | 07 Marks | 2,3;L2 |
| | c. | Eliminate left recursion from the following grammar. [Indirect and direct method]<br>S→AA\|b<br>A→SbS\|a | 08 Marks | 2;L3 |
| | | **UNIT-III** | | |
| 5. | a. | Define in inherited and synthesized translations. Give examples | 06 Marks | 2,3;L1 |
| | b. | Give syntax directed translation for simple Desk calculator and draw depending graph for expression.<br>1*2*3*(4+5) | 10 Marks | 2,3;L3 |
| | c. | Write syntax tree for the expression<br>i) a+(b*c)\|d<br>ii) if a=b then a =c+d else b=c-d | 04 Marks | 2,3;L6 |
| 6. | a. | Write syntax directed translation for Boolean expression | 10 Marks | 2,3;L3 |
| | b. | With a neat diagram explain symbol table organization for ALGOL | 10 Marks | 1,2;L2 |
| | | **UNIT-IV** | | |
| 7. | a. | With examples, explain the following<br>i) Lexical phase error<br>ii) Syntactic phase error<br>iii) Semantic phase error | 08 Marks | 1;L2 |

b. For the arraignment statement
A := −B*(C+D)
Write sequence of three address code, Quadruple, triple and Indirect representation 12 Ma ks 4;

8. a. With a neat diagram explain the layout of Activation records for a block structured Language with example. 08 Ma ks 1;

b. What is minimum distance (Hamming distance) error detection of syntactic error? Explain. 08 Ma ks 1;

c. What are the properties of a good error diagnostics? 04 Ma ks 1;

## UNIT-V

9. a. What are basic blocks and flow graphs? Write an algorithm for partitioning three address instructions into basic blocks. 10 Ma ks 4;

b. Explain optimization of basic block using DAG representation. Construct a DAG for the block
a=b+c
b=a-d
c=b+c
d=a-d 10 Ma ks 4;

10. a. Explain peephole optimization in detail. 10 Ma ks 4;

b. Discuss code generation algorithm for generating code when a sequence of Quadruples are given. 10 Ma ks 4;