

**Government College of Engineering Aurangabad**  
(An Autonomous Institute of Government of Maharashtra)

**BE (IT) FT Examination**

End Semester Examination November/ December 2016

**IT443: Elective- I - Compiler Construction**

Time: Three Hours **12 1, NOV 2016** Max. Marks: 60

"Verify the Course Code & check whether you have got the correct question paper"

- N.B:- 1. All questions are compulsory  
2. Figures to the right indicate full marks  
3. Assume suitable data if necessary & state it clearly  
4. Use of non-programmable calculator is allowed

**Q.1 Attempt any Two (12)**

- i) Explain with neat diagram, the various phases of a compiler. Mention the input and output for each phase.
- ii) Elaborate Recursive-Descent parsing technique with suitable example.
- iii) Consider the grammar:  $S \rightarrow iCtS \mid iCtSeS \mid a$ ,  $C \rightarrow b$ . Apply left factoring technique on this grammar.

**Q.2 Attempt any Two (12)**

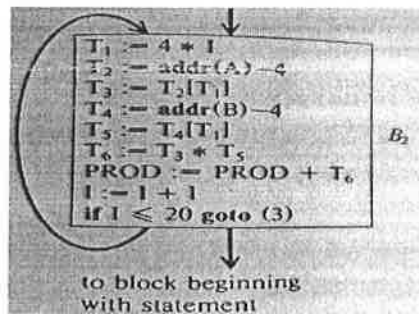
- i) Give SDT scheme for infix-postfix translation.
- ii) Explain any two data structures for symbol table in detail.
- iii) Translate the arithmetic expression  $a+-(b+c)$  into quadruples, triples and indirect triples.

**Q.3 Attempt any Two (12)**

- i) Describe the general structure of an activation record. Explain the purpose of each item in the activation record.
- ii) Discuss error recovery in LR parsing.
- iii) Explain the implementation of a simple stack allocation scheme.

**Q.4 Attempt any Two (12)**

- i) Discuss the principal sources of code optimization.
- ii) Calculate the three address code for the basic block shown below. Also draw DAG from it.



- iii) How to determine reaching definition? What are the data flow equations? Explain with suitable example.

**Q.5 Attempt any Two**

**(12)**

- i) What are the problems in code generation? Explain in detail with suitable example.
- ii) Produce the code sequence for the expression:  
 $W := (A-B) + (A-C) + (A-C).$
- iii) Elaborate the concept of common sub expressions with suitable example.