

**B.Tech. – VIEP – COMPUTER SCIENCE AND  
ENGINEERING (BTCSEVI)**

**Term-End Examination**

**December, 2015**

**BICS-016 : SYSTEM PROGRAMMING AND  
COMPILER DESIGN**

*Time : 3 hours*

*Maximum Marks : 70*

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*Note : Attempt any **seven** questions. All questions carry  
equal marks.*

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1. (a) Construct an NFA for the following regular expression : 5

$aa^* / bb^*$

- (b) Show that the following grammar is unambiguous :

$S \rightarrow aSb \mid bSa \mid b$

For a string  $abbbaabbaaab$  draw a Parse tree. 5

2. Explain the phases of a compiler in detail. Write down the output of each phase for the expression  $a = b * c + 50$ . Standard precedence for operator may be used. 10

3. Differentiate between the following : 2×5=10
- (a) SLR and LALR parsing
  - (b) Top down and Bottom up parsing
4. (a) Write quadruples and triples for the following expression : 5
- $$A = - b * (c + d) * e$$
- (b) Define a Finite Automata with an example. 5
5. (a) How is a Scope Information represented in a symbol table ? 5
- (b) Explain Machine-Independent optimization. 5
6. Explain the rules for construction of the denoted languages along with the regular expression construction rules. 10
7. Discuss Input Buffering and preliminary scanning in lexical analysis. 10
8. Discuss the role of syntax directed translation scheme. Give example. 10
9. (a) Write an algorithm for generating code from a directed acyclic graph. 5
- (b) How is the Syntax tree different from DAG ? 5

10. Write short notes on any *two* of the following :  $2 \times 5 = 10$

- (a) Loop Optimization
  - (b) Code Generation
  - (c) Recovery in a Compiler
  - (d) Debug Monitors
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