No. of Printed Pages : 3

BICS-016

B.Tech. – VIEP – COMPUTER SCIENCE AND ENGINEERING (BTCSVI)

Term-End Examination

June, 2016

00596

BICS-016 : SYSTEM PROGRAMMING AND COMPILER DESIGN

Time : 3 hours *Maximum Marks : 70*

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

1. What are the functions of a compiler ? What are the various phases of a compiler ? Explain the role of each phase. *10*

2. For the following grammar with S as starting symbol, find FIRST and FOLLOW sets of each of the non-terminals : *10*

   $S \rightarrow a\varepsilon B / bA / \varepsilon$

   $A \rightarrow aAb / \varepsilon$

   $B \rightarrow bB / \varepsilon$

3. What is operator precedence grammar ? Using the operator precedence parsing algorithm, construct parse for the following string : *10*

id + id * id

4. Consider the grammar :

$S \rightarrow iCt\ SS' / a$

$S' \rightarrow eS / \varepsilon$

$C \rightarrow b$

Construct predictive parsing table for the above grammar. *10*

5. What do you mean by DAG ? Explain the algorithm for constructing a DAG with the help of an example. *10*

6. (a) What is the difference between a compiler and an assembler ? *5*

(b) What is the importance of intermediate code generator in a compiler ? *5*

7. Define Code optimization. Explain the different loop optimization techniques with examples. *10*

8. Explain the concept of global data flow analysis. *10*

9. Define a Quadruple. How is it different from triples ? Convert the following expression into three address code and quadruple : *10*

$S = (a + b) / (c - d) * (e + f)$

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

(a) Ambiguous Grammar

(b) Lexical Analysis

(c) Handle Pruning

(d) Boot Strapping