No. of Printed Pages : 3 **BICS-016**

B.Tech. IN COMPUTER SCIENCE

Term-End Examination

June, 2012

01825

BICS-016 : SYSTEM PROGRAMMING AND COMPILER DESIGN

Time : 3 hours *Maximum Marks : 70*

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

1. Consider the following grammar.

$E \rightarrow TE'$

$E' \rightarrow +E/\epsilon$

$T \rightarrow FT'$

$T' \rightarrow T/\epsilon$

$F \rightarrow PF'$

$F' \rightarrow +F'/\epsilon$

$P \rightarrow (E)/a/b/\epsilon$

(a) Compute FIRST and FOLLOW for each non-terminal of the above grammar. **6**

(b) Show that the grammar is LL(1). **4**

2. (a) What is context free grammar ? Explain with an example. **5**

(b) Construct a NFA for aa*/bb* **5**

3. (a) Differentiate between Compiler and Assembler. 5

(b) Explain the importance of Intermediate Code generation phase in compiler design. 5

4. (a) Compare DFA with NFA using an example. 6

(b) Write quadruples, triples and indirect triples for the expression. 4

$-(a+b)^*(c+d)-(a+b+c)$

5. (a) What is Parse tree ? How can the ambiguity be removed ? Explain with an example. 6

(b) Differentiate between bottom up and Top down parsing techniques. 4

6. Consider the grammar.

$S \rightarrow AS/b$

$A \rightarrow SA/a$

(a) Is the grammar SLR ? If so, construct the SLR parsing table. 6

(b) List all the LR(o) items for the above grammar. 4

7. (a) Explain the code generation phase of compiler design using DAG. 5

(b) What is book keeping in the compiler ? 5

8. (a) How is linker different from loader ? 4

(b) Discuss error detection and recovery in compiler. 6

9. (a) Write the postfix notation of 4

(i) (a + b) * (c + d)

(ii) a * (b + c)

(b) Give the method of converting NFA into DFA with an example. 6

10. Write short notes on *any two*. 5+5=10

(a) Shift Reduce Parsing

(b) Lexical Analysis

(c) MACRO