USN | | | | | | | | | | |

06IS662

Sixth Semester B.E. Degree Examination, June/July 2014
Compiler Design

Time: 3 hrs. Max. Marks:100

Note: ***Answer FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Explain with diagram the different phases of compiler. Show the transition made by each of these phases for the statement value := int + rate * 10 **(12 Marks)**

b. Give reason for separating analysis phase into lexical analysis and parser. **(04 Marks)**

c. Write the transition diagram for relational operators and identifiers? **(04 Marks)**

2 a. Define left recursion and left factoring. Eliminate (i) Left recursion for grammar (1) (ii) Left factor for grammar (2) **(10 Marks)**

Grammar (1)

$B \rightarrow$ begin DL End | S

$D \rightarrow Dd_j \mid e$

$L \rightarrow L_jS \mid S$

Grammar (2)

$RE \rightarrow RE + RT \mid RT$

$RT \rightarrow RT\ Rf \mid RF$

$RF \rightarrow RF * \mid RP$

$RP \rightarrow a \mid b$

b. Explain error recovery strategies in predictive parser. **(05 Marks)**

c. For the grammar

$S \rightarrow SS + \mid SS * \mid a$

Give the left most and rightmost derivation for the string aa+a*. **(05 Marks)**

3 a. Given the Grammar

$S \rightarrow aABbCD \mid \in$

$A \rightarrow ASd \mid \in$

$B \rightarrow Sac \mid hC \mid \in$

$C \rightarrow Sf \mid Cg$

$D \rightarrow aBD \mid \in$

(i) Make necessary changes to make it suitable for LL(1) parsing.

(ii) Construct FIRST and FOLLOW set.

(iii) Construct the predictive parsing table.

(iv) Check whether the resultant grammar is LL(1) or not. **(14 Marks)**

b. Show the moves of the parser for the string ahfbf for the above question 3(a). **(06 Marks)**

4 a. Construct the SLR parse table for the following grammar:

$S \rightarrow AS \mid b$

$A \rightarrow SA \mid a$ **(10 Marks)**

b. For the given grammar construct LALR parsing table.

$S \rightarrow a \mid \uparrow \mid (R)$

$T \rightarrow S, T \mid S$

$R \rightarrow T$ **(10 Marks)**

PART – B

5 a. Explain the concept of syntax directed definition. **(05 Marks)**

b. For the grammar

$L \rightarrow En$

$E \rightarrow E_1 + T$

$E \rightarrow T$

$T \rightarrow T_1 * F$

$T \rightarrow F$

$E \rightarrow (E)$

$F \rightarrow$ digit

(i) Obtain the SDD for the above

(ii) and construct annotated parse tree for the string 3*5+4n **(10 Marks)**

c. Explain L-attribute definition. **(05 Marks)**

6 a. Obtain a directed acyclic graph and 3 address code for the expression (a+b) * (c+d) – (a+b). **(05 Marks)**

b. Obtain quadruples and triples for the above expression is (6(a)). **(05 Marks)**

c. Describe the method of generating intermediate code for flow control statements. **(10 Marks)**

7 a. Explain in detail the memory manager in heap management. **(05 Marks)**

b. Explain

(i) Activation record (ii) Activation tree. **(10 Marks)**

c. Explain access links for finding non local data onto the stack. **(05 Marks)**

8 a. Briefly explain the main issues in code generation. **(10 Marks)**

b. Obtain optimal machine code for the following 3-address code sequences. **(04 Marks)**

t = a + b	t = a + b
t = t * c	t = t + c
t = t / d	t = t / d

c. What are Basic blocks? Write an algorithm to partition the 3 address instructions into basic blocks. **(06 Marks)**

* * * * *