

## FACULTY OF INFORMATICS

B.E. 3/4 (I.T.) II – Semester (Main) Examination, May/June, 2011

## COMPILER CONSTRUCTION (Elective – I)

Time : 3 Hours ]

[ Max. Marks.: 75

**Note :** Answer all questions from Part – A. Answer any **Five** questions from Part – B.

## PART – A

(25 Marks)

1. Differentiate between single pass and multipass compilers. 2
2. What is a cross compiler ? 2
3. What is left recursion ? Remove left recursion from  $\text{exp} \rightarrow \text{exp} + \text{term} / \text{term}$ . 3
4. Write LR(0) items for the following grammar 3
 
$$S \rightarrow aAb / d$$

$$A \rightarrow AeS / S$$
5. What is an activation record ? What are its contents ? 3
6. Enumerate the ways a symbol table can be organized. 2
7. What is dynamic loading ? What are its advantages ? 3
8. What are attribute grammars ? 2
9. Define FIRST and FOLLOW sets. 3
10. What is meant by dead code ? 2

## PART – B

(50 Marks)

11. (a) Explain about various data structures used in a compiler. Specify where they are used. 5
- (b) Minimize the following DFA. 5

State	Input		Symbol
	a	b	
→A	B	C	
*B	B	D	
C	B	C	
*D	B	E	
E	B	C	

Where A is start state B and D are final states.

12. Construct LL(1) parsing table for the following grammar : 10
 
$$\begin{aligned} \text{exp} &\rightarrow \text{exp addop term} / \text{term} \\ \text{addop} &\rightarrow + / - \\ \text{term} &\rightarrow \text{term mulop factor} / \text{factor} \\ \text{mulop} &\rightarrow * \\ \text{factor} &\rightarrow (\text{exp}) / \text{number}. \end{aligned}$$

13. Construct SLR (1) parsing table for the following grammar : 10  
 $S \rightarrow I / \text{other}$   
 $I \rightarrow \text{if } S / \text{if } S \text{ else } S$
14. Write the attribute grammar for the following grammar and also draw the parse tree for the string  $w = \text{float } x, y$ . 10  
 $\text{decl} \rightarrow \text{type var-list}$   
 $\text{type} \rightarrow \text{int} / \text{float}$   
 $\text{var-list} \rightarrow \text{id, var-list} / \text{id}$
15. (a) Distinguish between static and dynamic storage allocations of a language. 5  
 (b) Explain how a hash table can be used to implement a symbol table. 5
16. (a) Explain about various code optimization techniques with an example. 5  
 (b) Write three address code and P-code for the following control statements : 5  
 (i) if (E)  $S_1$  else  $S_2$   
 (ii) while (E) S
17. Write short notes on : 10  
 (a) Error handling in top-down parsers.  
 (b) Code generation from DAGs.  
 (c) Semantic analysis.