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CSE304

Enrol. No. ....

[ET]

END SEMESTER EXAMINATION: NOV.–DEC., 2017

### COMPILER CONSTRUCTION

*Time : 3 Hrs.*

*Maximum Marks : 70*

*Note: Attempt questions from all sections as directed.*

#### SECTION – A (30 Marks)

*Attempt any five questions out of six.*

*Each question carries 06 marks.*

1. Analyze the working of a Compiler with the help of the following statement;

$x=a+b+c*100$

2. (a) Suppose you have to construct a compiler for a new language. Describe the process in its construction. Explain the changes required in the process if we change the target machine. (3)

- (b) Explain how LEX tool is used in compiler design. (3)

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3. What is the role of Symbol Table in compiler construction? How Symbol Table is implemented.
4. During the compilation process the compiler detects various errors. Explain in detail what are the different errors seen by each phase of the compiler.
5. (a) Design an NFA for regular expression  

$$(a \mid b)^* a (a \mid b) (a \mid b) \quad (3)$$
  
 (b) Design Annotated Parse tree for string  

$$(9+8*(7+6)+5)*4. \quad (3)$$
6. Consider the following grammar  

$$S \rightarrow a \mid ^ \mid (T)$$

$$T \rightarrow T,S \mid S$$
  
 (a) Compute LEADING and TRAILING for the grammar (2)  
  
 (b) Design the operator precedence parser for this grammar. (4)

**SECTION – B (20 Marks)**

*Attempt any two questions out of three.*

*Each question carries 10 marks.*

7. Consider the following grammar

$S \rightarrow Aa \mid bAc \mid Bc \mid bBa$

$A \rightarrow d$

$B \rightarrow d$

(a) Construct Canonical LR parser DFA for the above grammar. (6)

(b) Show that the given grammar is LR(1) but not LR(0). (4)

8. (a) Consider the following code :

```
for i:= 1 to N do
begin
term := 5;
if(i=1) then x=10 + term
y := x + N;
a[i] := y;
end
```

Optimize the above code fragment. (7)

(b) Draw DAG for the optimized code. (3)

9. (a) Explain the importance of Dependency Graph. (2)

(b) Construct Dependency Graph for  $id+id*id$ . (3)

- (c) How does compiler implements three address code? Explain with the help of example. (5)

**SECTION – C**  
(Compulsory)

(20 Marks)

10. (a) Design a top down parser for the following grammar :

$E \rightarrow E + T \mid T$

$T \rightarrow id \mid id[] \mid id[X]$

$X \rightarrow E, E \mid E$  (10)

- (b) Using the parsing table, check whether the string  $id + id[id+id \ id[]]$  belongs to the grammar or not. (5)

- (c) Discuss Recursive descent parsing. (5)