

VI-SEMESTER  
END SEMESTER EXAM(Supplementary)

B.Tech.(COE)  
Aug- 2018

CO-302 Compiler Design

Time: 3:00 Hours

Max. Marks: 40

Note: Attempt any Five questions

Q.No. 1

- A. Construct DFA accepting strings of binary digits which are divisible by 3. [3]
- B. Compute FIRST and FOLLOW sets and Construct a predictive parsing table for the following grammar, where S is the start symbol. [5]

$S \rightarrow aBDh$

$B \rightarrow cC \mid \epsilon$

$C \rightarrow bC \mid \epsilon$

$D \rightarrow EF$

$E \rightarrow g \mid \epsilon$

$F \rightarrow f \mid \epsilon$

(where ' $\epsilon$ ' denotes epsilon)

Q.No. 2

- A. What are the different error recovery strategies adopted in compiler? explain [3]
- B. Construct parsing table for the following grammar, where S is the start symbol [5]

$S \rightarrow AaAb$

$S \rightarrow BbBa$

$A \rightarrow \epsilon$

$B \rightarrow \epsilon$

Q.No. 3

- A. Discuss algorithm for computation of the sets of LR(1) items. Shows that the following grammar is LR(1) but not LALR(1) [3]

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

$A \rightarrow d$

$B \rightarrow d$

B. Consider following grammar

[5]

$S \rightarrow aAb \mid bB$

$A \rightarrow Aa \mid \epsilon$

$B \rightarrow Bb \mid \epsilon$

and test whether the grammar is LL(1) or not?

Q.No. 4

A. What is the advantage of left recursive grammar over right recursive grammar in LR parsing. Explain with suitable example. [3]

B. Consider the program fragment and Generate three address code for it [5]

```
sum=0
for(i=1;i<=20;i++)
sum=sum+a[i]+b[i];
```

Q.No. 5

A. What is the use of FA in lexical analysis? Design a DFA for strings over {0, 1} having an even number of 0's and any no. of 1's. [3]

B. Explain importance of PDA in compiler design and Design a PDA for Language  $L = \{ 0^n 1^n \mid n \geq 0 \}$ . [5]

Q.No. 6

A. What is loop jamming? Explain code optimization by eliminating induction variables and code motion with suitable examples. [4]

B. Write SDD for generating three address code for Boolean expressions with &&, || (OR) and ! Operators. [4]

Q.No. 7

A. What are the various approaches for symbol table organization? Explain with examples. [3]

B. Give syntax tree, Directed acyclic graph (DAG) And three address code for expression if (a>0) then a= 3\*(b+1) else b = b+1. [5]