B.E. / B.Tech. Computer Science & Engineering (Model Curriculum) Semester-VI
TEE201CS / COMDESIGN1 - Compiler Design

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Notes : 1. All questions carry equal marks.
2. Due credit will be given to neatness and adequate dimensions.
3. Illustrate your answers wherever necessary with the help of neat sketches.
4. All questions are compulsory.

1. a) What is symbol table? Explain how symbol table is used in different phases of compiler. **8**

b) What is native compiler? Explain how cross compilers are useful for developing the software. **8**

OR

2. a) What are the rules to write LEX program also explain different functions used in LEX program with suitable example. **8**

b) Write short note on. **8**
i) Incremental compiler.   ii) Bootstrapping.

3. a) Evaluate the first ( ) and follow ( ) for the following grammar. **8**
$S \to X\ Y\ Z\ I\ /\ y\ W\ X$

$X \to j\ Y\ W\ P\ /\ \varepsilon$

$Y \to W\ k\ X\ /\ i\ l$

$W \to e\ d\ /\ \varepsilon$

$P \to y\ m\ /\ i$

b) Write short note on: **8**
i) Brute Force Technique.   ii) Recursive Descent Parsing.

OR

4. a) Justify the statement: **8**
Every LR (0) grammar is SLR(1) but every SLR(1) grammar need not be LR(0) with suitable example.

b) What do you mean by operator precedence parsing, with the help of following grammar parse the input string "$n*n+n$" **8**
$J \to J+J$

$J \to J*J$

$J \to n$

5. a) Translate the following statement into intermediate code and also draw the parse tree. **10**
$A[I,J,K]=B[I,J]+C[I+J+K]$

where,
A is 3D array of size 10 x 10 x 10
B is 2D array of size 10 x 10
C is 1D array of size 30
b p w = 2

b) What is synthesizer attributes and inherited attributes. Explain with suitable example. **6**

<p align="center">**OR**</p>

6. a) Generate 3 address code for the following statement. **8**
for (i = 1; < = 10; i++)
if (a < b) then x = y + z

b) Write SDTS (Syntax Directed Translation Scheme) for the following statement. **8**
i) While statement   ii) Repeat until.

7. a) Write and explain different symbol table organization in compiler. **8**

b) Explain error detection and recovery with respect to all phases of compiler. **8**

<p align="center">**OR**</p>

8. a) Generate target code for the three address code for the assignment statement. **8**
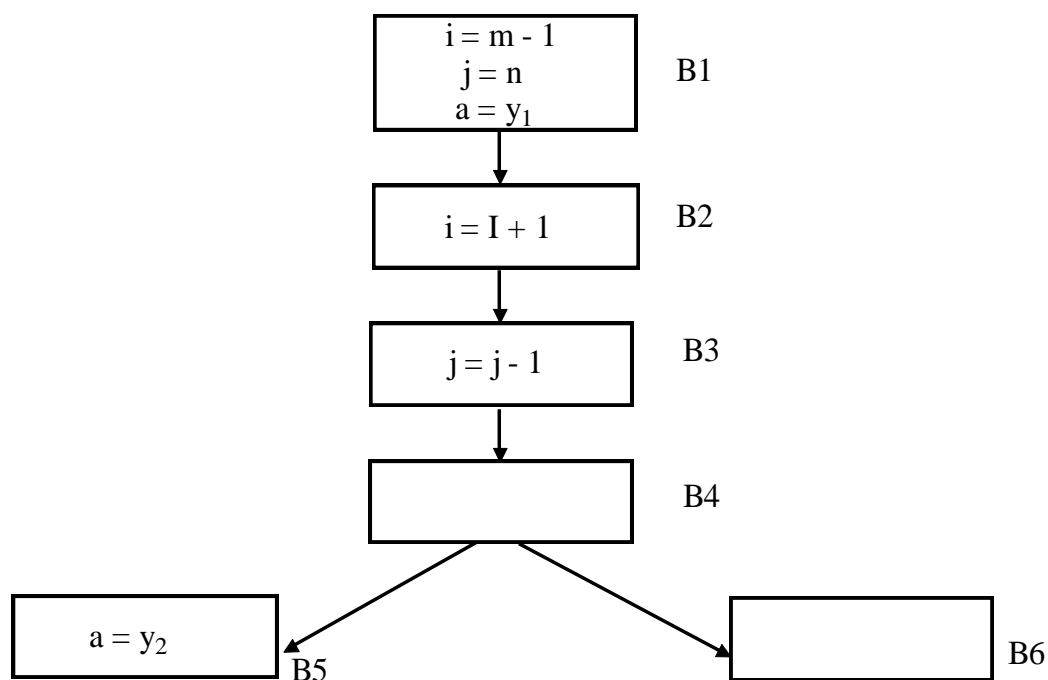$r = (x + y) * (x − z) + (x − z)$

b) Write short note on type checking. **8**

9. a) Generalize the process of optimization of basic blocks. Give an example. **8**

b) Write short note on. **8**
i) Loop jamming   ii) Loop unrolling.

<p align="center">**OR**</p>

10. a) Compute IN and OUT using iterative solution of data flow equation. **16**

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