B.E. (Computer Engineering) Seventh Semester (C.B.S.)

Elective - I : Compiler Construction

P. Pages : 2 **NRT/KS/19/3597**

Time : Three Hours * 0 2 7 8 * Max. Marks : 80

Notes :
1. All questions carry marks as indicated.
2. Solve Question 1 OR Questions No. 2.
3. Solve Question 3 OR Questions No. 4.
4. Solve Question 5 OR Questions No. 6.
5. Solve Question 7 OR Questions No. 8.
6. Solve Question 9 OR Questions No. 10.
7. Solve Question 11 OR Questions No. 12.

1. a) What do you mean by phase and a pass of a compiler? Explain lexical analysis phase of compiler in detail. **9**

b) What are compiler writing tools. **5**

OR

2. a) Explain block diagram of phases of a compiler. **7**

b) What is cross compiler. Explain Boats trapping compiler in detail. **7**

3. a) Construct LR (0) parsing table for the grammar. **7**

$S \rightarrow CC$

$C \rightarrow CC / d$

b) Construct LL (1) parser for the following. **7**

$S \rightarrow ASa / \in$

$A \rightarrow Bb / CC$

$B \rightarrow bd / \in$

OR

4. a) Construct LR (1) parsing table for the following grammar. **8**

$S \rightarrow xAy / xBy / xAz$

$A \rightarrow q / qS$

$B \rightarrow q$

b) What is the significance of FIRST & Follow in top down parsers? **6**

5. a) Explain various storage allocation strategies used in compiler construction. **6**

b) Give SDTS and generated three address code for the following statement **7**

$A[i, B[K]] = B[i + k] + A[i, k]$

assume array A is of size 20×30 and B is of size 30 and bpw = 4.

OR

6. a) Give SDTS and three address code of following program fragment **7**

while $(a < 10$ and $C > D)$ do

if $(a < b)$ then

$a = a + b$

else

$b = a + b$

b) Explain Activation record in detail. **6**

7. a) Explain error recovering in LL (1) parsing. **7**

b) Explain the three address code. Translate the following expression into Quadruples, Triples & indirect triples **6**

$$-(x+y)+z+(z*(x+y))+(x-y)*w)$$

OR

8. a) Write SDTS to generate TAC for expression **7**
$P < Q$ or $R < S$ and $T < U$

b) Write SDTS for 'FOR' loop. Also give suitable example to convert a for loop in TAC. **6**

9. a) Discuss the various errors encounterd during various phases of compiler. Explain with suitable example. **7**

b) Discuss the role of symbol table, during the compilation process. **6**

OR

10. a) Explain peephole optimization in detail. **6**

b) What is DAG? Explain how DAG is used in code generation with suitable example. **7**

11. a) What do you mean by machine independent optimization? List various machine independent and machine dependent optimization. Explain any one machine dependent optimization with example. **7**

b) Draw DAG & generate code for following statements. **6**

$t_1 = x + y$

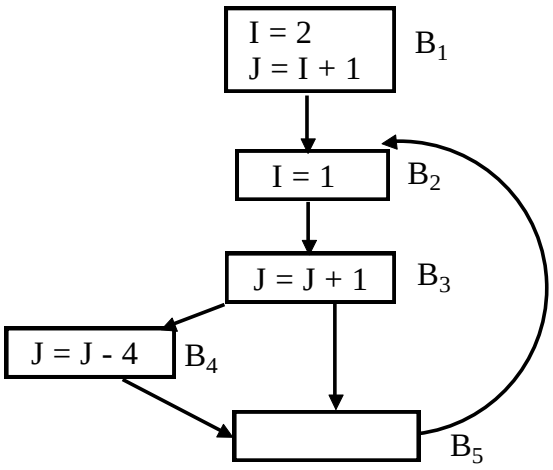
$t_2 = a + b$

$t_3 = f - t_2$

$t_4 = t_1 - t_3$

OR

12. Compute IN & OUT of following flow graph. Also compute u – d chain. **13**



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