



Notes : 1. All questions are compulsory.

1. a) Explain the need for dividing the compilation process into various phases and explain its functions of each and every phase using the expression. 8
 $p = v * t * q / m + n$
- b) Explain the advantages of Analysis-synthesis model of compilation. 8
- OR**
2. a) What is LEX? Give the specification of LEX input and output. 8
- b) Describe cross compiler in detail with example. 8
3. a) Construct the LALR parsing table for the following grammar. 12
 $S \rightarrow L = R / R$
 $L \rightarrow *R / id$
 $R \rightarrow L$
- b) How SLR parsing table can be implemented. 4
- OR**
4. a) Construct CLR parsing table for the following grammar. 11
 $S \rightarrow CC$
 $C \rightarrow eC / d$
- b) Explain the role of Parser in detail. 5
 What are the error recovery methods of LR Parsers.
5. a) Generate three-address code for the following statement, where byte per word are 4(four). 8
 $Sum = 0;$
 $for(i = 1; i \leq 10; i++)$
 $sum = sum + a[i] + b[i]$
- b) Write SDTS for the following statements. 8
 i) Repeat until statement. ii) Switch-case.
- OR**
6. a) What is synthesized and inherited attributes? Explain with example. 6
- b) 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 $10 \times 10 \times 10$
 B is 2D array of size 10×10
 C is 1D array of size 10
 bpw = 2

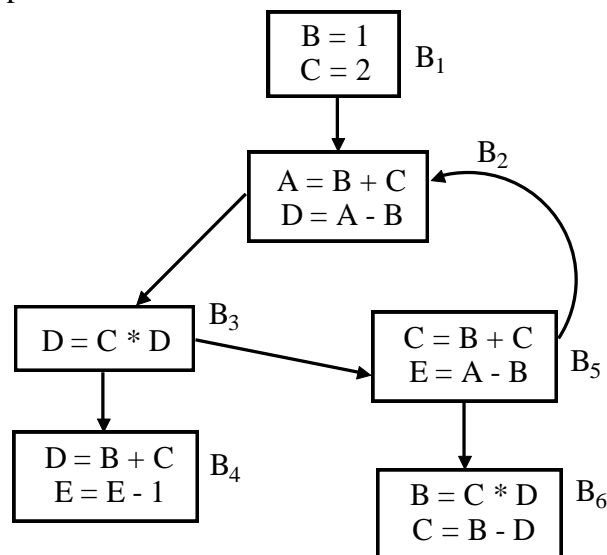
7. a) Write heuristic algorithm for optimal ordering of code. Explain the algorithm with the help of example. 8
- b) Generate code for the following TAC using simple code generation algorithm. 8
- $$T_1 = A + B$$
- $$T_2 = C + D$$
- $$T_3 = E - T_2$$
- $$T_4 = T_1 - T_3$$

OR

8. a) What is labelling algorithm? Write labelling algorithm to determine the minimum number of register required to evaluate the tree. 8
- Evaluate the following expression using labelling algorithm.
 $z = x - y + x * y * v$
- b) Explain various data structure available for construction of symbol table. 8
9. a) Explain various kinds of optimization that can be performed in a loop. 8
- b) Generate the three address code for the following program fragment. 8
- ```
do
begin
 PROD = PROD + P [I] * Q [I]
 I = I + 1
end
while (I ≤ 20)
```
- Construct DAG (Directed acyclic graph) & eliminate local common subexpression of the above generated three address code.

OR

10. a) Consider the flow graph. 12



Compute GEN, KILL, IN and OUT of each block after second iteration.

- b) What is leader statement? Explain with suitable example. 4

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