

M.E. Second Semester (Computer Science & Engineering / Computer Engineering) (F.T.) (CGS)
13149 : Advance Compiling Techniques : 2 RMEF 2 / 2 RME 2 / 2 KMEF 2

P. Pages : 3

Time : Three Hours



AW - 3678

Max. Marks : 80

- Notes : 1. Assume suitable data wherever necessary.
2. Illustrate your answer necessary with the help of neat sketches.

1. a) State and explain set of procedures that create, destroy and manipulate the symbol table and its entries. 7
b) Explain routine for storage binding of local variables. 6

OR

2. a) What typical fields are present in symbol table? What is the significance of Global symbol table and local symbol table. 7
b) Write register tracking procedures. 6
i) Sym-To-Reg ().
ii) Reg-To-Sym ().
iii) Alloc-Reg ().
3. a) What are the changes need to be incorporated to convert MIR int LR? List any four types of assignment statement. 8
b) What is ICAN? Illustrate the folloing with an example. 6
i) HIR in ICAN and ii) IIR in ICAN.

OR

4. a) Explain XBNF syntax of the following MIR instruction. 6
i) MIR Inst ii) Receive Inst
iii) Ifinst
- b) Give the sequence of ICAN tuples corresponding to following LIR code given below. 8
L₁ : r₁ ← [r₇ + 4]
r₂ ← [r₇ + r₈]
r₃ ← r₁ + r₂
r₄ ← -r₃
if r₃ < 0 go to L₂
r₅ ← (r₉)r₁
r₆ ← [r₇-8](2)
L₂ : return r₄.
5. a) What is stack frame? Is it advantageous to use stack pointer alone or frame pointer alone or both? Explain the purpose of alloc () function. 7

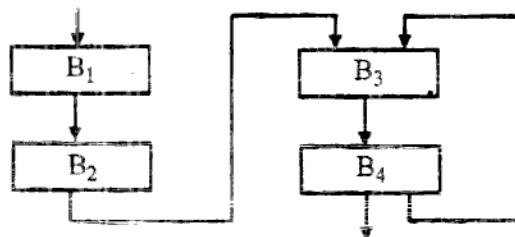
- b) List and explain various data types and approaches to representing them efficiently at run time. 6

OR

6. a) What are the issues to be consider while passing parameters using call by value and call by reference Justify with a situation. 6
- b) What do you mean by code sharing and position independent code? Distinguish both of them on the basis of functionality. 7
7. a) Explain in brief two approaches that produce code generator from machin description. 6
- b) Explain Fix_Synt_Blocks () routine to repair syntactic blocking by generalizing one or more nonterminals. 7

OR

8. Write the machine description rules for the machine description grammar for the following LIR instructions. Also trace the action/next table on the intermediate code string 13
- $\leftarrow R_{12} + R_{33}$
- LIR instructions:
- $R.2 \leftarrow R.1$
- $R.3 \leftarrow R.1 + R.2$
- $R.3 \leftarrow R.1 + K.2$
- $R.2 \leftarrow [R.1]$
- $[R.2] \leftarrow R.1.$
9. a) Explain in detail how to perform interval analysis. Illustrate the steps carried out for analysis. 7
- b) Consider the following graph & apply $T_1 - T_2$ transformation & obtained control tree. 7

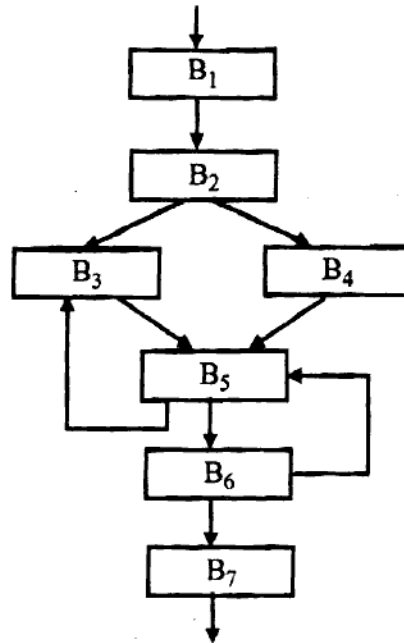


OR

10. a) Explain the generic depth-first search and its importance. 7

- b) Applying interval analysis, obtain the control tree for the following flow graph.

7



11. a) Evaluate the space and time complexity of associating data flow information with edges in a flow graph versus node entries and exits. 7
- b) Explain in brief. 6
- i) Dd-Chains. ii) Webs
- iii) Du-Chains.

OR

12. a) Give the illustration of flow functions for structural analysis of conditional statement. Extend the same for either of condition. 7
- b) Explain the copy and constant propagation analysis. Hence discuss their importance in the relative situations. 6
