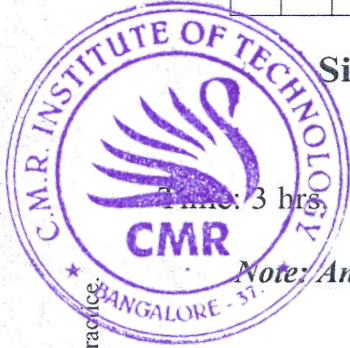


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Sixth Semester B.E. Degree Examination, Jan./Feb. 2023 System Software and Compiler Design

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Define system software. Distinguish between system software and application software. (06 Marks)
- b. List out registers used in SIC/XE machine architecture along with their use. (10 Marks)

OR

- 2 a. Explain the data structures and pass-1 algorithm of SIC assembler. (08 Marks)
- b. Define Macro. Give the features of macro processors and explain the data structures used in macro processors. (08 Marks)

Module-2

- 3 a. What is loader? What are the basic functions the loader has to perform? (04 marks)
- b. Develop an algorithm for bootstrap loader. (07 marks)
- c. Explain dynamic linking with suitable diagram. (05 Marks)

OR

- 4 a. Differentiate between a linking loader and linkage editor, with the help of suitable diagram. (08 marks)
- b. Explain different loader option commands with examples. (04 marks)
- c. Illustrate MS - DOS object module with its record types. (04 Marks)

1 of 3

Module-3

- 5 a. List and explain the various phases of a compiler and show the output of each phase for the expression $a := b + c * 25$. (08 marks)
- b. Construct transition diagram for recognizing relational operators. Sketch the program segment to implement it, showing the first state and one in final state. (08 marks)

OR

- 6 a. Explain input buffering strategy used in lexical analysis phase. (06 Marks)
- b. Write the regular definition for unsigned number, also write the transition diagram. (06 Marks)
- c. Construct the transition diagrams for a set of keywords like begin, end, if then and else and identifiers and constants along with a minimum set of relational operators. (04 Marks)

Module-4

- 7 a. What is top down parser? What are key problems in top down parsing? (08 Marks)
- b. Explain the ambiguity in arithmetic expression. What is the ambiguity in parsing $2 + 3 \times 4$? Explain the solution for it. (08 Marks)

OR

- 8 a. What is meant by handle processing? How it helps on shift reduce parsing? List the actions of a shift reduce parser? (08 Marks)
- b. Form the Action/Goto table for the following grammar:
- $S \rightarrow Aa \mid bAc \mid Ba \mid bBa$
- $A \rightarrow d$
- $B \rightarrow d$
- Justify whether the grammar is LR(0) or not. (08 Marks)

Module-5

- 9 a. Define synthesized and inherited attributes with examples. (04 Marks)
- b. Briefly explain the main issues in code generation. (08 Marks)
- c. Explain in brief dead code elimination. (04 Marks)

OR

- 10 a. Construct DAG for the expression,
 $a + b * (a + b) + c + d$ (04 Marks)
- b. Give SDD of a simple calculator. (04 Marks)
- c. Write a note on common sub expression. (04 Marks)
- d. What are the steps involved in optimization of basic blocks. Explain any 2 steps in brief. (04 Marks)
