

CBCS Scheme

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15CS63

Sixth Semester B.E. Degree Examination, June/July 2018 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 advantages and disadvantages? Explain boot strap loader with algorithm. (08 Marks)
b. Enlist any four different loader option commands. (04 Marks)
c. Define the following: i) Linking loader ii) Dynamic linking. (04 Marks)

OR

- 4 a. Explain the working of linkage editor and linking loader. (08 Marks)
b. Write the data structures and pass 2 algorithm for linking loader. (08 Marks)

Module-3

- 5 a. What is compiler? Explain various phases of compiler with help of neat diagram. (10 Marks)
b. Explain the concept of input buffering in the lexical analysis. (06 Marks)

OR

- 6 a. Construct the transition diagram to recognize the tokens given below:
i) Identifier ii) Relational operator iii) Unsigned number. (08 Marks)
b. Create a lexical analyzer with Lex and explain the structure of Lex programs. (08 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)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

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:

$$S \rightarrow Aa|bAc|Ba|bBa$$
$$A \rightarrow d$$
$$B \rightarrow d$$

Justify whether the grammar is LR (0) or not.

(08 Marks)

Module-5

9 a. Discuss S-attributes and L-attributes with respect to SDD (Syntax Directed Definition).

(04 Marks)

b. Construct the syntax tree for the expression $x * y - 5 + z$.

(04 Marks)

c. Explain the translation of expression address code of

i) Quadruples ii) Triples iii) Indirect triples, with examples.

(08 Marks)

OR

10 a. Briefly explain the main issues in code generation.

(08 Marks)

b. Generate code for the following expression using the code generator algorithm.

$$x := (a + b) * (c - d).$$

(08 Marks)

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