

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020
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. Explain the various instruction formats used in SIC/XE machine. (04 Marks)
- b. Write a SIC/XE program to copy the string "COMPUTER SCIENCE ENGINEERING" from STR1 to another string STR2. (06 Marks)
- c. List the functions of Pass-1 and Pass-2 of a two pass assembler. (06 Marks)

OR

2. a. Write an algorithm of the Pass-1 of a two pass assembler. (08 Marks)
- b. List the various machine independent assembler features. Explain the control-sections, how the assembler converter them into object code. (08 Marks)

Module-2

3. a. Define Macro. Explain how Macros are defined and expanded. (07 Marks)
- b. What are the basic functions of a loader? Explain two ways of program relocation in loaders. (09 Marks)

OR

4. a. Explain the functions of dynamic linking with a diagram. (08 Marks)
- b. Write a note on MS-DOS linker. (08 Marks)

Module-3

5. a. Explain the different phases of a compiler, with an example. (09 Marks)
- b. What is input buffering in lexical analysis? List the different methods of input buffering explain any one of them. (07 Marks)

OR

6. a. List and explain the reasons for separating the analysis portion of a compiler into lexical and syntax analysis phases. (06 Marks)
- b. Construct the transition diagram to recognize the tokens of
 i) Identifier ii) Relational operators iii) Unsigned numbers. (06 Marks)
- c. Define Tokens, patterns, lexemes. (04 Marks)

Module-4

7. a. What is the role of parser? Explain the different error recovery strategies. (08 Marks)
- b. Construct the LL(1) parsing table for the following productions:

$$E \rightarrow E + T/T ; T \rightarrow T * F/F ; F \rightarrow (E)/id$$
 (08 Marks)

OR

- 8** a. Using operator-precedence parsing algorithm, construct the table and parse the input string
 $\text{id} + \text{id} * \text{id}$. (12 Marks)
 b. Define Handle, viable prefixes. (04 Marks)

Module-5

- 9** a. Discuss S-attributed and L-attributed SDD. (06 Marks)
 b. Write 3-address code syntax tree and DAG for the expression $a + a * (b - c) + (b - c) * d$. (10 Marks)

OR

- 10** a. Obtain the SDD and construct annotated parse tree for the input string $6 * 5 + 3$, for the grammar
 $S \rightarrow EN$
 $E \rightarrow E + T/T$
 $T \rightarrow T * F/F$
 $F \rightarrow (E)/\text{digit}$
 $N \rightarrow ;$ (10 Marks)
 b. Discuss the issues in the design of code generator. (06 Marks)

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