



# CBCS SCHEME

15CS63

## 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  $id + id * id$ . (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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