



CBCS SCHEME

18MCA34

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Third Semester MCA Degree Examination, Feb./Mar. 2022 System Software

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- Write and explain the instruction formats of SIC/XE architecture. (06 Marks)
 - Explain the architecture of SIC machine with respect to registers, data formats, instruction formats and addressing modes. (08 Marks)
 - Write an Assembly program in SIC/XE to perform 'ABC = ALPHA * 10-50' use register addressing for multiplication and subtraction. (06 Marks)

OR

- Write the algorithm of PASS-1 of two pass algorithm. (10 Marks)
 - Find out the target address for the following SIC/XE instructions:
i) 032600 ii) 03C300 iii) 00B600 iv) 6D101000
Assume content of register as [(X) = 000090, (B) = 006000, (PC) = 003000]. (10 Marks)

Module-2

- Discuss the symbol defining statements used in assembler with an example. (10 Marks)
 - Generate the object code for the following program using the OPCODES as given:
(CLEAR = B4, LDS = 6C, ADD = 18, STA = 0C)

```
DEMO  START      0
      CLEAR      X
      +LDS      #4096
      ADD       @TAB
      STA      ALPHA, X
ALPHA  RESW      256
TAB    RESB      4
      END
```

(10 Marks)

OR

- Explain the working of Load-and-go assembler with proper example. (10 Marks)
 - Explain the concept of program relocation with diagram. Explain how reallocation problem of extended format is solved using modification record. (10 Marks)

Module-3

- Write the algorithm of an absolute loader. (05 Marks)
 - Write and explain the format of reallocation bit in program. (05 Marks)
 - Illustrate the concept of program linking performed by the loader with a block diagram. (10 Marks)

OR

- 6 a. Compare and explain linking loader and linkage editor with diagram. (15 Marks)
 b. Write a note on MSDOS linker. (05 Marks)

Module-4

- 7 a. Explain the different data structures used by macro processor with block diagram. (12 Marks)
 b. Explain with example concatenation of macro parameters. (08 Marks)

OR

- 8 a. List and explain basic macro processing functions with suitable example. (10 Marks)
 b. Describe the salient features of ANSI C macro processor. (10 Marks)

Module-5

- 9 a. Write a BNF grammar for assignment statement of C program for expression $SUM = A * (B + 50)$. Generate the parse tree for this expression using BNF grammar. (10 Marks)
 b. Briefly discuss different machine dependent code optimization techniques. (10 Marks)

OR

- 10 a. Using the given finite automata, check if the following strings are recognized (or) not
 i) abca ii) abccccabc iii) abababcab iv) abcabccaac. (10 Marks)

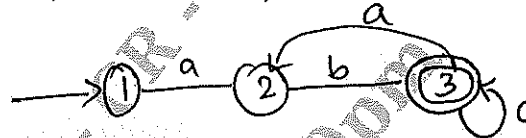


Fig. Q.10(a)

- b. Write a note on:
 i) P-code compiler
 ii) YACC compiler.

(10 Marks)
