CBCS SCHEME

USN

18MCA34

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

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

OR

2 a. Write the algorithm of PASS-1 of two pass algorithm. **(10 Marks)**
   b. 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

3 a. Discuss the symbol defining statements used in assembler with an example. **(10 Marks)**
   b. 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

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

Module-3

5 a. Write the algorithm of an absolute loader. **(05 Marks)**
   b. Write and explain the format of reallocation bit in program. **(05 Marks)**
   c. 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 grammer for assignment statement of C program for expression SUM = A * (B + 50). Generate the parse tree for this expression using BNF grammer. (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
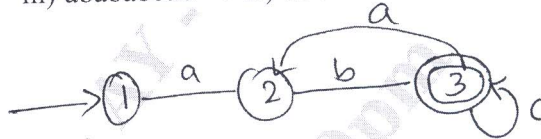   i) abca   ii) abccccabc   iii) abababcab   iv) abcabccaac. (10 Marks)

Fig.Q.10(a)

   b. Write a note on:
        i)   P-code compiler
        ii) YACC compiler. (10 Marks)

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