CBCS SCHEME

USN | 1 | A | Y | 19 | M | C | A | 5 | 2 |

18MCA34

Third Semester MCA Degree Examination, Dec.2019/Jan.2020
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. Explain the architecture of SIC program. **(12 Marks)**
   b. Explain the following with respect to SIC/XE machine Architecture with example.
   (i) Instruction formats (ii) Addressing modes. **(08 Marks)**

2 a. What are the basic functions of an assembler? Explain Basic Assembler Directives with example. **(10 Marks)**
   b. Write an algorithm for Pass-1 assembler. **(10 Marks)**

Module-2

3 a. Generate an object code for the following program using the OPCODES as given and also construct the symbol table.

```
Sample    START    1000
          LDS      #3
          LDT      #300
          LDX      #0
ADDLP     LDA      ALPHA, X
          ADD      BETA, X
          STA      GAMMA, X
          ADDR,    S, X
          COMPR    X, T
          JLT      ADDLP
ALPHA     RESW     100
BETA      RESW     100
GAMMA     RESW     100
OPCODE :
  LDA – 00        LDS → 6C
  STA – 0C
  LDX – 04
  ADD – 18
  COMPR – A0
  JLT – 38
  LDT – 74
  ADDR – 90
```
(10 Marks)

   b. What is relocatable program? Explain the concept of Program relocation with an example and the means for implementing it. **(10 Marks)**

4 a. Write an algorithm for one-pass assembler. **(12 Marks)**
   b. Write a note on MASM assembler. **(08 Marks)**

Module-3

5 a. What are the functions of a loader? (08 Marks)
   b. Write the algorithm for pass -1 and pass – 2 of a linking loader. Also explain the data structures. (12 Marks)

6 a. Explain the following loader design options :
      (i) Linkage Editor   (ii) Dynamic Linking (12 Marks)
   b. Write and explain an algorithm for absolute loader. (08 Marks)

Module-4

7 a. Explain Macro Definition and Expansion. (06 Marks)
   b. Explain Macro processor algorithm and data structures. (14 Marks)

8 a. Explain the following :
      (i) Concatenation of macro parameters
      (ii) Keyword macro parameters. (12 Marks)
   b. Explain Recursive Macro Expansion. (08 Marks)

Module-5

9 a. Explain recursion descent parsing. Write recursive descent Parse for 'READ' statement. (10 Marks)
   b. Indicate whether the finite automation given in Fig.Q9(b), recognize the following strings:
      (i) 9Alpha   (ii) Num – 2   (iii) –Hello   (iv) aaa – 8 –
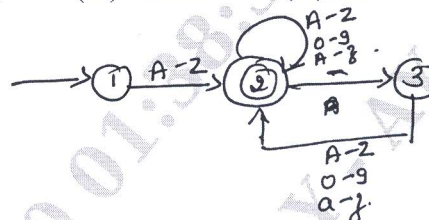

Fig.Q9(b) (04 Marks)

   c. Define the following terms :
      (i) Grammar   (ii) Lexical analysis (06 Marks)

10 a. By using the BNF grammar below represent the syntax analysis of the PASCAL statement.
       VAR := SUMSQ DIV 100 – MEAN * MEAN in the parse tree.
       <assign> :: = id := <exp>
       <exp> :: = <term> | <exp> + <term> | <exp> – <term>
       <term> :: = <factor> | <term> * <factor> | <term> DIV <factor>
       <factor :: = id | int | (<exp>) (10 Marks)
    b. Briefly discuss different machine dependent code optimization techniques. (10 Marks)

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