CBCS SCHEME

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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.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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)**

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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 –

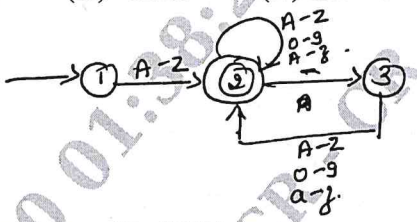

Fig.Q9(b) **(04 Marks)**

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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