

# CBCS SCHEME

18MCA34

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## Third Semester MCA Degree Examination, July/August 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 a sequence of instructions for SIC/XE and set the elements of an array ALPHA of size 100 words to 0. Use immediate addressing, registers – to – register instruction to make process efficient. (04 Marks)
- b. Explain the instruction formats and addressing modes clearly indicating the settings of flag bits with reference to SC/XE machine. (08 Marks)
- c. What are the basic functions of assembler? Explain the various data structures used by it with example. (08 Marks)

OR

- 2 a. Write a sequence of instructions for SIC to set 20-byte string to blank. (04 Marks)
- b. Describe the memory, registers, data formats and instruction format of VAX machine. (08 Marks)
- c. Determine the target address for the following instruction (hex)  
i) 032600    ii) 03C300    iii) 022030    iv) 010030  
v) 003600 given (B) = 006000 (PC) = 03000 (X) = 000090. (08 Marks)

### Module-2

- 3 a. Write the formats of header and text records with example for each. (04 Marks)
- b. Translate the following assembly language program to object program, clearly showing the symbol table entries.

```
COPY    START
         LDT    #3
         LDX    #0
MOVECH LDCH    STR1, X
         STCH    STR2, X
         TIXR    T
         JLT    MOVECH
         STR1    BYTE    C 'EOF'
         STR2    RESB    3
         END    FIRST
```

LDT – 74, LDX – 04, LDCH – 50, STCH – 54, TIXR – B8, JLT – 38, T – 5, X – 1.

- c. Write a note on following : i) Literals    ii) MASM assembler. (08 Marks)

OR

- 4 a. Compare literal and immediate operand. (04 Marks)
- b. Explain with example, the object code generation of statements with different instruction formats and addressing modes. (08 Marks)
- c. Demonstrate the working of assembler in handling the program blocks. (08 Marks)

**Module-3**

- 5 a. Write algorithm of the absolute loader. (04 Marks)  
 b. Discuss the two methods of specifying the relocation as a part of object program and also tell why modification record scheme is not convenient way for all machine architectures. (08 Marks)  
 c. Briefly explain the features of Loader. (08 Marks)

**OR**

- 6 a. Write algorithm of SIC/XE relocating loader. (04 Marks)  
 b. Demonstrate the working of linking loader with the neat diagram. (08 Marks)  
 c. Describe the features of MS – DOS Linker. (08 Marks)

**Module-4**

- 7 a. What is Macro Processor? Give its function with example. (04 Marks)  
 b. Consider the following macro definition RDBUFF.

```

RDBUFF MACRO & INDEV, &BUFADR, &RECLTH, &EOR, &MAX
IF (&EOR NE '')
&EORCK SET 1
ENDIF
CLEAR X
CLEAR A
IF (&EORCK EQ 1)
LDCH = X '&EOR'
RMO A, S
ENDIF
IF (MAX EQ ')
+LDT #4098
ELSE
+LDT #&MAX
ENDIF
$LOOP TD =X '&INDEV'
JEQ $LOOP
RD =X '&INDEV'
MEND
  
```

Expand the macro for the following macro invocations

RDBUFF F3, BUF, RECL, 04, 2048

RDBUFF 0E, BUFFER, LENGTH, ,80

(08 Marks)

- c. Write short notes on :

i) Keyword macro parameters

ii) General purpose macro processors.

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(08 Marks)

**OR**

- 8 a. Briefly explain concatenation of macro parameters with example. (04 Marks)  
 b. Explain the datastructures used by the macroprocessor with example. (08 Marks)  
 c. Describe the features of MASM Macro processor with appropriate example. (08 Marks)

**Module-5**

- 9 a. List and brief the steps involved in compilation process with example. (08 Marks)  
 b. Explain recursive – decent parsing technique with the example of READ statement. Write the procedures and graphical representation of process. (08 Marks)  
 c. Write a note on :  
 i) P – code compliers  
 ii) Complier – compliers. (04 Marks)

OR

- 10 a. Using the given finite automation, check if the following string are recognized or not :  
 i) A123 ii) NIEH\_ iii) PIE\_CHART iv) C\_

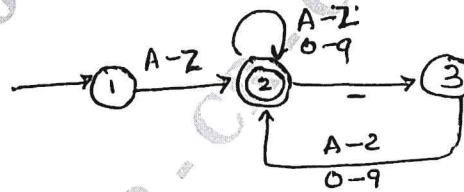


Fig.Q10(a)

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- b. What is code optimization? Explain the various techniques used by the compiler for code optimization. (08 Marks)  
 c. Write short notes on :  
 i) Interpreters  
 ii) Compilation of structured variables. (04 Marks)

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