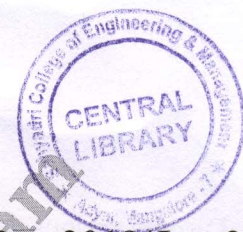


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Fifth Semester B.E. Degree Examination, Dec.2019/Jan.2020
System Software

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting
at least TWO questions from each part.**

PART - A

- 1
 - a. Bring out the difference between application software and system software. Give example for each. (06 Marks)
 - b. With reference to SIC machine architecture, discuss (i) Memory (ii) Registers (iii) Instruction format (iv) Addressing modes. (08 Marks)
 - c. Write sequence of SIC/XE to set array element to 0 if the value of the array is element is less than 16 or else set to 1 (Assume that array of 100 words). (06 Marks)
- 2
 - a. Write an assembly program on SIC machine to implement block move from a memory address M1 to another address M2, without overlap. (06 Marks)
 - b. Write an algorithm for Pass-1 of an assembler. (08 Marks)
 - c. Show the structure of a Header record, Text Record and Modification record taking one example for each. (06 Marks)
- 3
 - a. With suitable example, explain the use of LTORG assembler directive. (04 Marks)
 - b. Apply the algorithm of Pass 1 and Pass 2 to assemble the following SIC source program. Write an object program. (10 Marks)

```

SUM      START      2000
FIRST    LDX         ZERO      LDX = 04
          LDA         ZERO      LDA = 00
LOOP     ADD         TABLE, X  ADD = 18
          TIX         COUNT     TIX = 2C
          JLT        LOOP      JLT = 38
          STA         TOTAL     STA = 0C
          RSUB        RSUB = 4C
TABLE    RESW        2000
COUNT   RESW        1
ZERO     WORD        0
TOTAL    RESW        1
          END         FIRST

```

- c. What is program relocation? Explain the need for relocation with an example. (06 Marks)
- 4
 - a. Explain a simple Bootstrap loader with a source program. (06 Marks)
 - b. Write an algorithm for Pass 1 of a linking loader. (06 Marks)
 - c. With a neat diagram, explain how object program is processed using (i) Linking loader. (ii) Linkage editor. (08 Marks)

PART - B

- 5
 - a. With a neat diagram, explain the structure of a text editor. (08 Marks)
 - b. Discuss the functions and capabilities of interactive system. (07 Marks)
 - c. Write a note on the aspect of user-interface criteria in a text editor. (05 Marks)

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.

- 6 a. Discuss various data structures required for a design of a macroprocessor. (06 Marks)
b. Explain with example:
(i) Concatenation of macro parameters.
(ii) Generation of unique labels. (09 Marks)
(iii) Recursive macro expansion. (05 Marks)
c. Write a note on MASM macro processor. (05 Marks)
- 7 a. Describe the general structure of LEX program. (04 Marks)
b. Explain the meta-characters used in regular expression with example. (06 Marks)
c. Write a LEX program to count the number of characters words, spaces and lines in a given input file. (06 Marks)
d. Write a LEX program to count the number of positive and negative integers and positive and negative fractions. (04 Marks)
- 8 a. Explain how grammar conflicts are handled by YACC with example. (06 Marks)
b. Write a YACC program to evaluate an arithmetic expression involving operators +, -, * and /. (07 Marks)
c. Write a YACC program to check whether the given string $a^n b^n$ ($n \geq 1$) is accepted by the grammar or not. (07 Marks)
