



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)

- 6 a. Discuss various data structures required for a design of a macroprocessor. (06 Marks)
- b. Explain with example:
- (i) Concatenation of macro parameters. (09 Marks)
  - (ii) Generation of unique labels. (05 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 grammer 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 grammer or not. (07 Marks)

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