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**Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019**  
**System Software**

Time: 3 hrs

Max. Marks:100

**Note: Answer any FIVE full questions, selecting  
atleast TWO questions from each part.**

**PART - A**

- 1 a. Why SIC is called hypothetical computer? Explain SIC machine architecture with respect to registers, instruction format and instruction sets. (06 Marks)
- b. List and explain instruction formats of SIC/XE machine. Find the target address, addressing mode and value of register 'A' for the following machine code using memory address or content given :

	Address	Content
i) 03C300 (B) = 007000	3030	003600
ii) 010030 (PC) = 005000	3600	103000
iii) 003600 (X) = 000090	7390	00C303
	C303	003030

(10 Marks)

- c. Write a SIC/XE program to add corresponding elements of array A and B, and store result in array C, where array size is 200 words each. (04 Marks)
- 2 a. What are the steps required to translate source code to object code. Write the format of header, text and end records. (06 Marks)
- b. What are the data structures used in assembler? Write pass-2 algorithm of assembler. (08 Marks)
- c. Write an object code for following SIC/XE instructions:
- i) 0017 J CLOOP (CLOOP at location 0006)
- ii) 103C +LDT #4096 (Object code of J is 36h and LDT is 74h)
- iii) 0020 LDT #3 (06 Marks)

- 3 a. Explain symbol defining statements and expressions. Identify the type of following expressions:

1. ABCDEF - GHIJKL
2. 100 - ABCDEF
3. 50 \* GHIJKL
4. XYZABC + ABCXYZ

where all variables represents address within program. (08 Marks)

- b. Explain control section in detail with format of define, refer and modification record (revized). (08 Marks)
- c. What are different assembler design options? Load-and-go assembler is useful in program development and testing, give reasons. (04 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.

- 4 a. What are the relocating loaders? Write an algorithm for SIC/XE relocating loader. (06 Marks)  
 b. What are the different loader design options? Explain linkage editor in comparison with linking loader. (08 Marks)  
 c. Explain MS-DOS linker with object module. (06 Marks)

**PART - B**

- 5 a. Define document. What are the tasks accomplished by document editing process? (04 Marks)  
 b. With neat diagram explain structure of editor. (08 Marks)  
 c. What are the debugging functions and capabilities? (08 Marks)
- 6 a. What are the data structures used in macroprocessor? Write an algorithm for DEFINE, EXPAND and GETLINE procedures. (10 Marks)  
 b. Explain any two machine independent macro processor features. (06 Marks)  
 c. Explain ANSIC macro processor. (04 Marks)
- 7 a. What are the meta symbols? Write any five meta symbols and its use. (04 Marks)  
 b. Write and explain specification of lex program. (05 Marks)  
 c. Write a lex program to count number of keywords, relational operations, logical operator and special operators. (06 Marks)  
 d. Write LEX program to remove single in line comments in C program using command line arguments. (05 Marks)
- 8 a. What is parser? What is the output expected from parser? Write following CFG in YACC equivalent form  

$$A \rightarrow BC + | CD - | EF * | \epsilon$$
 (04 Marks)  
 b. Write a YACC program to evaluate given expression using un-ambiguous grammar. (08 Marks)  
 c. What is the need of priority and associativity? Show with program how they are implemented in YACC program. (08 Marks)

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