

**B.E. COMPUTER SCIENCE AND ENGINEERING THIRD YEAR FIRST SEMESTER
SUPPLEMENTARY EXAM- 2018**

Subject: SYSTEM PROGRAMMING

Time: Three hours

Full marks: 100

Answer any 5 questions

1. a. What are the advantages and disadvantages of one pass assembler? How does two-pass assembler address the problems of one pass assembler? 5+
5
- b. Is relocation necessary to design a machine independent loader? Justify your answer with appropriate examples. 5
- c. What are the advantages and disadvantages of holding symbolic operation codes in a separate symbol table? 5
2. a. Immediate operands and literals are both ways of specifying an operand value in a source statement. What are the advantages and disadvantages of each? When might each be preferable to the other? 5+
5
- b. Design the algorithm for absolute loader. 5
3. a. How will you design a macro processor with nested definitions and calls? Explain with proper flow diagram. 15
- b. Describe the functionality of Simple Bootstrap Loader. 5
4. a. Describe the different machine dependent and machine independent features of macro processor. 6
- b. What are the differences between nested and recursive macro call? 4
- c. Describe the algorithm of two-pass assembler. 10
5. a. What are the salient aspects of a Text Editor? What is the structure of typical Text editor? Explain with appropriate diagram. 3+
7
- b. Why standard object code format is necessary? Explain with an example? 6
- c. How does loader resolve between a user-defined function and library defined function with the same name? 4
6. a. What is the difference between linkage editor and linking loader? 5
- b. What are the needs of Symbol Table (SYMTAB) and Operation Code Table (OPTAB) during design of an assembler? 5
- c. Assume an assembly program segment of a SIC machine is described in Table -1. Write down the contents of the symbol table after processing each of the instructions done by a simple load-and-go assembler. 10

Table -1

LC value	SIC statements		
120...		LDA	LENGTH
123....		COMP	ZERO
126....		JEQ	EXIT
129.....		LDCH	BUFFER
132...		STCH	BUFFER
135...	EXIT	STA	BUFFER
138.....	LENGTH		RESW 1
142.....	BUFFER	BYTE	'ABC'