


Bachelor of Computer Science and Engineering Examination- 2017
(3rd year 1st Semester)

Subject: System Programming

Time: Three hours

Full marks: 100

Question no 1 is compulsory. Answer any 4 questions from the rest

1.
 - a. What are the fundamental components of Von-Neumann Architecture? Explain with proper block diagram. 3
 - b. What do you mean by cross assembler? 2
 - c. What are the constraints of writing a macro library? 2
 - d. How does macro processor address the problem of calling recursive macro? 3
 - e. What do you mean by boot strap loader? 3
 - f. What are the differences between static and dynamic linking? 3
 - g. What are the advantages and disadvantages of separating the tasks of a linker and a loader into separate program? 4
2. 
 - a. Why standard object code format is necessary? Explain with an example? 6
 - b. How does loader resolve between a user-defined function and library defined function with the same name? 4
 - c. Write an assembly language resident program to repeat every Key Press event three times 10
3.
 - a. What is the difference between the assembler directive EXTREF and EXTDEF? 3
 - b. What is the significance of relocation bit? Explain with proper example? 4
 - c. How does the macro processor resolve the labels within a macro when it calls more than once? 5
 - d. Write an assembly language program to find maximum and minimum from an array. 8

LOCAL

4. a. What is the utility of Program Segment Prefix? 3
- b. What is the difference between linkage editor and linking loader? 5
- c. What are the needs of Symbol Table (SYMTAB) and Operation Code Table (OPTAB) during design of an assembler? 5
- d. Assume an assembly program segment of a SIC machine is described in Table -1. 7
Write down the contents of the symbol table after processing each of the instructions done by a simple load-and-go assembler.

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	C'ABC'

Table -1

5. a. What are the advantages and disadvantages of one pass assembler? How two pass assembler addresses those problems of one pass assembler? 4+4
- b. Is relocation necessary to design a machine independent loader? Justify your answer with appropriate examples. 3
- c. What are the differences between Debug and MASM? 4
- d. What do you mean by indirect addressing? 2
- e. What are the differences between SCANS and CMPS instruction? 3
6. a. What do you mean by conditional macro expansion? What are the relations present between Nested Macro definitions and Recursive Macros? 2+3
- b. What are the important features of MS-DOS linker? 5
- c. What are the salient aspects of a Text Editor? What is the structure of typical Text editor? Explain with appropriate diagram? 3+7