

**FIFTH SEMESTER B.TECH DEGREE EXAMINATION  
COMPUTER SCIENCE AND ENGINEERING  
(2013 SCHEME)**

**13.504 SYSTEM PROGRAMMING (RF)  
MODEL QUESTION PAPER**

*Part A (20 marks) – Answer All Questions. Questions carries 4 marks each.*

1. Define System Software. Bring out the differences between System Software and Application software
2. Discuss need of memory relocation in assemblers. Sketch the structure of modification record used in assemblers.
3. Dynamic linking works for transfers of control only. How could the implementation be extended so that the data references could also cause dynamic loading to occur.
4. How could a programmer decide whether to use a macro or a subroutine accomplish a given logical function?
5. Explain the relationship of debugger with other parts of the system.

(5x4=20)

**PART B**

(Answer *one full* question from each module)

**MODULE I**

6. (i) Describe SIC/XE machine architecture with all options. (10 Marks)
- (ii) Find the Target Address and Value loaded in to Accumulator from following after execution of instruction LDA of SIC/XE (5 Marks)

:	:
<b>3030</b>	003600
:	:
<b>3600</b>	103000
:	:
<b>6390</b>	00C303
:	:
<b>C303</b>	003030

(B)=006000

(PC)=003000

(X)=000090

n	i	x	b	p	e	Disp/Addr
1	1	0	0	1	0	600 H
1	1	1	1	0	0	300 H
1	0	0	0	1	0	30 H
0	1	0	0	0	0	30 H
0	0	0	0	1	1	600 H
1	1	0	0	0	0	C303

(iii) Discuss addressing modes used in Pentium pro machine architecture (5)

**OR**

7. (i) Write a Sequence of instruction for SIC to clear a 20 byte string to all blanks (5)  
(ii) With an example explain I/O operation of SIC/XE.(5)  
(iii) Explain all features RISC machine with an example (10)

**MODULE II**

8. (i) Translate (by hand) the following assembly program to SIC/XE object code. Starting address program is 1000(H) .Also assume Opcode for instruction. The output format will contains H record, T record, and E record. (10)

```

STRCP2      START      1000
FIRST       LDT         #11
            LDX         #0
MOVECH      LDCH        STR1,X
            STCH        STR2,X
            TIXR        T
            JLT         MOVECH
STR1        BYTE        C'TEST STRING'
STR2        RESB        11
            END         FIRST

```

(ii) Explain program block with an example, a machine independent assembler feature . (10)

**OR**

9. (i) Explain the following machine independent features of assembler (7)  
a)Literals b)Symbol defining statements c) Expressions

- (ii) Explain control section and program linking (8)
- (iii) Write short notes on MASM assembler (5)

### **MODULE III**

10. (i) What would be the advantages and disadvantages of writing a loader using a high level programming language? What problem might you encounter and how might these be solved? (5)
- (ii) Write an algorithm for an absolute loader (5)
  - (iii) Modify macro algorithm so as to include the generation of unique labels.(10)

#### **OR**

11. (i) Suppose that a computer primarily uses direct addressing, but has several different instruction formats. What problems does this create for the relocation bit approach to program relocation? How might these problems solved? (5)
- (ii) Write the algorithm for pass 1 of an linking loader. (5)
  - (iii) Explain various macro processor design options. (10)

### **MODULE IV**

12. (i) Explain various steps in editing and structure of an editor with neat diagram.(10)
- (ii) Describe file system architecture of UNIX operating system.(10)

#### **OR**

13. (i) Explain the significance of type oriented and menu oriented user interfaces and give differences between them. (10)
- (ii) Explain the services offered by unix machine (5)
  - (iii) Describe kernel data structure of unix machine (10)