



Reg. No. : .....

Name : .....

**Fifth Semester B.Tech. Degree Examination, December 2016  
(2013 Scheme)**

**13.504 : SYSTEM PROGRAMMING (FR)**

Time : 3 Hours

Max. Marks : 100

**PART – A**

Answer **all** questions. **Each** question carries **4** marks :

1. What are the different instruction formats in SIC/XE assembler ?
2. What is a forward reference ? How it can be solved using back-patching ?
3. Explain the use of following assembler directives.
  - i) BYTE
  - ii) EQU
  - iii) RESW
  - iv) ORG.
4. Write an algorithm for an absolute loader.
5. What are the different tasks involved in a document editing process ? **(5×4=20 Marks)**



**PART – B**

Answer **one full** question from **each** Module :

**Module – I**

6. i) Describe the characteristics of Pentium PRO architecture. **8**
- ii) Write a subroutine for SIC that will read a record into a buffer. The record may be any length from 1 to 100 bytes. The end of the record is marked with a "null" character (ASCII 00). The subroutine should place the length of the record read into a variable LENGTH. **8**

P.T.O.



- iii) Write a sequence of instructions for SIC/XE to find the sum and difference of two variables A and B, each of one word and store the result in variables C and D. 4

OR

7. i) Describe the characteristics of Power PC architecture. 8  
 ii) Describe the instruction formats and addressing modes of SIC/XE architecture. 7  
 iii) Write a program for SIC/XE machine to copy a 11 byte string from one location to another. 5

### Module – II

8. i) How literals are handled by the SIC assembler? 6  
 ii) Explain the use of assembler directives 'EXTDEF' and EXTREF' with example. 4  
 iii) Consider the following assembly program.

STRPGM	START	1000
FIRST	LDX	ZERO
MOVECH	LDCH	STR1, X
	STCH	STR2, X
	TIX	ELEVEN
	JLT	MOVECH
STR1	BYTE	C'TEST STRING'
STR2	RESB	11
ZERO	WORD	0
ELEVEN	WORD	11
	END	FIRST

- a) Identify task performed by the above program.  
 b) Generate symbol table.  
 c) Generate the complete object program, with the format containing Header record, Text record. End record, for above program. Assume Opcode for instruction.

10

OR





9. i) What are the various data structures needed in pass – I of the two-pass assembler ? Explain. 5

ii) Translate (by hand) the following assembly program to SIC/XE object code. Also assume Opcode for instruction. The output format will contains Header record, Text record, End record.

```

RECTOBUF   START   3000
RDREC      LDX     ZERO
           LDA     ZERO
RLOOP      TD      INPUT
           JEQ    RLOOP
           RD     INPUT
           COMP   ZERO
           JEQ    EXIT
           STCH  BUFFER, X
           TIX   MAXLEN
           JLT   RLOOP
EXIT       STX     LENGTH
INPUT     BYTE    X'F1'
ZERO      WORD    0
MAXLEN    WORD    4096
BUFFER    RESB   4096
LENGTH    RESW   1
           END    RDREC

```



10

iii) What is a control Section ? How it differs from program blocks ? 5

**Module – III**

10. i) What is program relocation ? Explain the structure of modification record used for program relocation. 6

ii) Write the algorithm for pass I of an linking loader. Explain. 8



- iii) Suggest a design for a one-pass linking loader. What restrictions (if any) would be required? What would be the advantages and disadvantages of such a one-pass loader? 6

OR

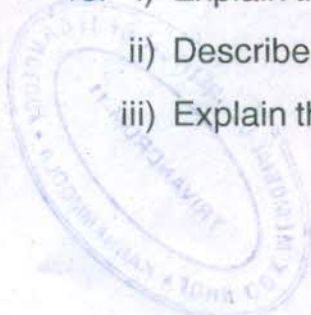
11. i) Explain various data structures of a macro processor with example. 8  
ii) Explain various macro processor design options. 12

#### Module – IV

12. i) Describe the structure of a typical editor. 10  
ii) Explain how breakpoint mechanism helps in debugging process. 5  
iii) Differentiate between same-process debugger and separate-process debugger. 5

OR

13. i) Explain the features of UNIX operating system. 5  
ii) Describe the UNIX architecture. 8  
iii) Explain the kernel data structures of UNIX operating system. 7



\_\_\_\_\_