ONE TIME EXIT SCHEME

Fifth Semester B.E. Degree Examination, April 2018

System Software

Time: 3 hrs.

Max. Marks: 100

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

PART – A

1 a. Explain the instruction formats and addressing modes of SIC/XE. (10 Marks)
   b. Write a program in both SIC and SIC/XE to copy a character string 'system software' to another string. (10 Marks)

2 a. Explain the five fundamental functions of an SIC assembler. (05 Marks)
   b. What is program relocation? Illustrate how a modification record is used in relocation of program. (05 Marks)
   c. Generate the complete object program for the source-program given below. Given that CLEAR = B4, LDA = 00, LDB = 68, ADD = 18, TIX = 2C, JLT = 38, STA = 0C

   ```
   SUM     START   0
   FIRST   CLEAR   X
           LDA     #0
           +LDB    #TOTAL
           BASE    TOTAL
   LOOP    ADD     TABLE, X
           TIX     COUNT
           JLT     LOOP
           STA     TOTAL
   COUNT   RESW    1
   TABLE   RESW    2000
   TOTAL   RESW    1
           END     FIRST
   ```
   (10 Marks)

3 a. Distinguish between literal and immediate operands. How does the assembler handle the lateral operands? (05 Marks)
   b. Explain how multipass assembler handler the following forward reference:
   1) HALFSZ EQU MAXLEN/2
   2) MAXLEN EQU BUFFEND – BUFFER
   3) PREVB EQU BUFFER – 1
   4) BUFFER RESB 1000H
   5) BUFFEND EQU *
   Assume that, when assembler goes to line 4, location counter contains 1034 (Hexa). (10 Marks)
   c. Compare a two-pass assembler with a one pass assembler. How forward references are handled in one-pass assembler? (05 Marks)

4 a. Write the code for bootstrap loader. Explain briefly. (05 Marks)
   b. Explain the data structures used in linking loaders. (05 Marks)
   c. Explain machine dependent features of loader. (10 Marks)

PART – B

5   a.   With a neat diagram, explain the structure of a text editor.   (10 Mark)
    b.   Explain the debugging functions and capabilities of an interactive debugging system.
                                                                                          (06 Mark)
    c.   Write a note on the concept of user interface criteria in a text editor.   (04 Mark)

6   a.   Define MACRO. Briefly explain the various data structures used in the design of MACR
         PROCESSOR.   (10 Mark)
    b.   Explain the following machine independent macro processor features with examples:
         i)   Concatenation of macro parameters.
         ii) Generation of unique labels.
         iii) Keyword macro parameters.   (10 Mark)

7   a.   Explain the communication between the parser and lexer with a neat block diagram.
                                                                                          (05 Mark)
    b.   What is a regular expression? Explain the various regular expressions in UNIX wi
         examples for each.   (10 Mark)
    c.   Write a LEX program to count the number of vowels and consonants in a given string.
                                                                                          (05 Mark)

8   a.   What is shift/reduce parsing? Explain the parsing of the input AKSATHA = 15 + 16 a
         represent using parse tree.   (10 Mark)
    b.   Write a YACC program to evaluate an arithmetic expression involving operators +, –.
         and /.   (06 Mark)
    c.   Discuss conflicts in YACC.   (04 Mark)

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