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13MCA24

**Second Semester MCA Degree Examination, June/July 2015**  
**System Programming**

Time: 3 hrs.

Max. Marks:100

**Note: Answer any FIVE full questions.**

1.
  - a. With reference to the standard SIC/XE model, discuss the data formats, instruction formats and addressing modes. (10 Marks)
  - b. Give the Target address generated for the following machine instruction
 

i) 03C 300 h	}	If (B) = 006000
ii) 0100 30 h		(PC) = 003000
iii) 0310C303 h		(X) = 000090.

(06 Marks)
  - c. Write sequence of instruction for SIC to copy from STR1 to STR2. (04 Marks)
  
2.
  - a. Write an algorithm for one pass assembler. (10 Marks)
  - b. Generate the object code for the below SIC/XE. Also show the contents of symbol table.
 

```

SUM      START      4000
          LDX      ≠ 0
          LDA      ≠ 0
          + LDT      ≠ 4000
          BASE     COUNT
LOOP     ADD      TABLE , X
          TIXR     T
          JLT      LOOP
          STA      TOTAL
          RSUB
TOTAL    RESW     1
TABLE    RESW     4000
COUNT   RESW     1
          END

OP codes
LDX - 04 , LDA - 00 , LDT - 74 , ADD - 18 ,
TIXR - B8 , JLT - 38 , STA - 0C , RSUB - 4C.
```

(10 Marks)
  
3.
  - a. With the help of an Algorithm, explain how relocation is done using modification bits. (07 Marks)
  - b. Define terms : i) Loading ii) Relocation iii) Linking. (03 Marks)
  - c. Write and explain the algorithm for Pass - 1 of a linking loader along with Data structures. (10 Marks)
  
4.
  - a. Explain the following Loader design options :
    - i) LINKAGE EDITOR
    - ii) DYNAMIC LINKING.(10 Marks)
  - b. Write in brief : i) Boot Strap Loader ii) MS - DOS Linker. (10 Marks)
  
5.
  - a. Explain the working of a text editor, with a neat block diagram. (10 Marks)
  - b. Explain the debugging functions and debugging capabilities. (10 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
 2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.

- 6** a. Write and explain the algorithm for One Pass Macroprocessor. Briefly discuss various Data structures for a design of One – Pass Macroprocessor. **(12 Marks)**  
b. Explain any 2 Machine – independent Macroprocessor features. **(08 Marks)**
- 7** a. With an illustrative example, explain the Macro Processing features of MASM Macro Processor. **(10 Marks)**  
b. What are different Macro Processor Design options? Explain briefly. **(10 Marks)**
- 8** a. Explain the recursive decent parsing. Write the recursive decent parse for a “READ” statement. **(10 Marks)**  
b. Briefly discuss the different machine dependent code optimization techniques. **(10 Marks)**

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