Second Semester MCA Degree Examination, June/July 2016
System software / System Programming

Time: 3 hrs.

Max. Marks:100

Note: *Answer any FIVE full questions.*

1 a. Compare system software and application software. Give examples for each. **(04 Marks)**
   b. Discuss the architecture of SIC/XE. **(12 Marks)**
   c. Assume that 100 words of data are stored from LOCI. Write a SIC program to copy these words to another location in memory starting from LOC2. **(04 Marks)**

2 a. Explain the following with an example for each : i) START ii) TIX iii) JSUB iv) STL. **(08 Marks)**
   b. Write an algorithm for pass1 and pass2 of SIC assembler. **(12 Marks)**

3 a. Explain what is relocation. How relocation using modification record is achieved? **(10 Marks)**
   b. Explain 1 — pass assembly process. **(10 Marks)**

4 a. What are the basic functions of a loader? **(04 Marks)**
   b. Explain a simple bootstrap loader for SIC/XE with an algorithm. **(06 Marks)**
   c. Write the algorithm for pass–1 and pass–2 of a linking loader. **(10 Marks)**

5 a. Explain the structure of a Text Editor with suitable diagram. **(10 Marks)**
   b. What are the different components of a debugging system? Explain. **(10 Marks)**

6 a. Discuss the different data structures used by a macro processor. **(10 Marks)**
   b. Explain the following :
      i) Conditional macro expansion
      ii) Generation of unique labels. **(10 Marks)**

7 a. i) Consider the following finite automata. Check whether the following strings are recognized or not. i) abc ii) abbc iii) aabbc iv) ac v) acbbb. **(05 Marks)**
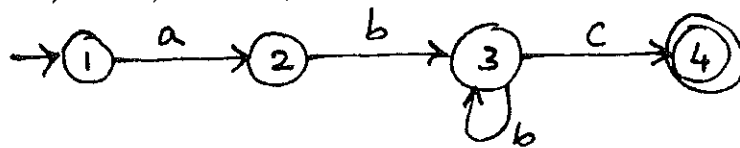
Fig. Q7(a)

   ii) Write a finite automata to recognize an identifier with the following rules :
      i) An identifier should start with an alphabet
      ii) Subsequent character can be an alphanumeric
      iii) An identifier may or may not have an under score in between other characters, but not in the beginning or at the end. **(05 Marks)**
   b. Write parse tree for the following statements :
      i) WRITE(MEAN, VARIANCE)
      ii) VARIANCE : = SUM DIV 100 –MEAN * MEAN. **(10 Marks)**

8 Write short notes on :
   a. MASM assembler
   b. MS–DOS linker
   c. Shift–reduce parsing
   d. P–code compiler. **(20 Marks)**

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