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18MCA34

Third Semester MCA Degree Examination, July/August 2021
System Software

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions.

1 a. Differentiate between System Software and Application Software. **(05 Marks)**
   b. Describe the architecture of SIC/XE Assembler. **(15 Marks)**

2 a. Assume that two sets of 100 words are stored from location ALPHA and BETA respectively. Write a program to ADD them, store in another location GAMMA. **(08 Marks)**
   b. Describe the architecture of VAX assembler. **(12 Marks)**

3 a. Describe the following with example:
      (i) WORD   (ii) TIX   (iii) LDA   (iv) STL. **(12 Marks)**
   b. Describe various data structures used by the SIC assembler. **(08 Marks)**

4 a. Describe the structure of the following records with respect to SIC assembler:
      (i) Header   (ii) Text   (iii) End **(10 Marks)**
   b. Design Pass-1 of a Two-pass assembler. **(10 Marks)**

5 a. Explain Bit-Mask Technique to relocate a program in memory. **(10 Marks)**
   b. Design an algorithm for a Bootstrap loader. **(10 Marks)**

6 a. Design a format for the following records.
      (i) Define   (ii) Refer   (iii) Modification **(10 Marks)**
   b. Design an algorithm for a linking loader (Pass-1). **(10 Marks)**

7 a. Discuss the different data structures used by macroprocessor. **(10 Marks)**
   b. Design a 1-pass macroprocessor algorithm. **(10 Marks)**

8 a. Describe the generation of unique labels. **(08 Marks)**
   b. Explain the conditional macro expansion. **(12 Marks)**

9 a. Discuss the different phases of a compiler. **(10 Marks)**
   b. Construct a parse tree for the following expression:

      VARIANCE := SUMSQ DIV 100 – MEAN * MEAN **(10 Marks)**

10 a. Consider the following automata and check whether the following strings are recognized or not. [Refer Fig.Q10(a)]

Fig.Q10(a)

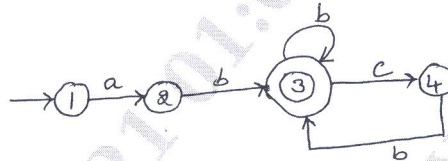(i) abbbcb   (ii) abc   (iii) abcb

(iv) acccb   (v) abccc   (10 Marks)

b. Design an algorithm to recognize an identifier with an underscore (_) where underscore (_) does not appear as the starting and ending character.   (10 Marks)

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