CBCS SCHEME

USN [| | | | | | | | |]

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)]

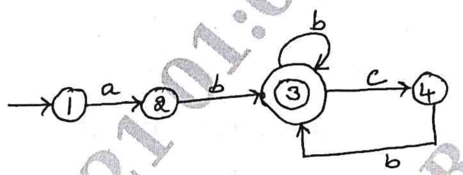

Fig.Q10(a)

(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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