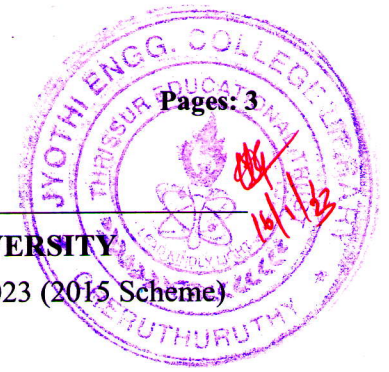Reg No.:_____                Name:_____

# APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree (S, FE) Examination January 2023 (2015 Scheme)

**Course Code: CS303**

**Course Name: SYSTEM SOFTWARE**

Max. Marks: 100                                        Duration: 3 Hours

## PART A

*Answer all questions, each carries 3 marks.*                Marks

| | | |
|---|---|---|
| 1 | List any three instructions that can set the condition code to indicate the result of the operation in SIC/XE Architecture. | (3) |
| 2 | Write a SIC program to copy string from LOC1 to LOC2. Initialize LOC1 with a sample string. | (3) |
| 3 | What are the uses of OPTAB and SYMTAB during the assembling process? Specify the uses of each during pass 1 and pass2 of a two pass assembler. | (3) |
| 4 | What is meant by forward reference? How is it resolved by two pass assembler? | (3) |

## PART B

*Answer any two full questions, each carries 9 marks.*

| | | | |
|---|---|---|---|
| 5 | a) | Write a sequence of instructions for SIC/XE to send even numbers in an array to output device F5. | (5) |
| | b) | Explain assembler directives. Give any six assembler directives with their use, in SIC. | (4) |
| 6 | a) | Give the instruction formats in SIC/XE Architecture? | (4) |
| | b) | Define Program relocation? How is modification record used for relocation in assemblers? Explain with an example. | (5) |
| 7 | a) | Design an algorithm for pass 1 operations of a two pass assembler for SIC architecture. | (5) |
| | b) | Explain the following: (i) Operating System (ii) Compiler (iii) Interpreter | (4) |

## PART C

*Answer all questions, each carries 3 marks.*

| | | |
|---|---|---|
| 8 | Explain how the assembler handles the use of literals in assembly language program. | (3) |

9       Explain the features of a MASM assembler.                                    (3)

10      Write the algorithm for Absolute Loader.                                     (3)

11      Define dynamic linking. What are its advantages?                             (3)

## PART D

*Answer any two full questions, each carries 9 marks.*

12      Can the following code with forward refernces resolved by a two pass         (9)
        assembler? Justify your answer.

        Following is a code segment with forward references. How does a multi-pass
        assembler resolve such forward references? Show the steps in detail. Let the
        LOCCTR hold hexadecimal value 1000 at line 6.

| Line No | | | |
|---|---|---|---|
| 1 | MID | EQU | FULL/2 |
| 2 | FULL | EQU | END-BEG |
| 3 | PREV | EQU | BEG-1 |
| . . . | | | |
| 6 | BEG | RESB | 4096 |
| 7 | END | EQU | * |

13  a)  With a figure explain the working of linkage editors and linking loaders.   (4)

    b)  Explain how external references are handled during linking of control sections.  (5)

14      Write the algorithms for pass1 and pass2 of a linking Loader.                (9)

## PART E

*Answer any four full questions, each carries 10 marks.*

15  a)  Explain keyword macro parameters with example.                              (3)

    b)  Write the algorithm for one- pass macro processor.                          (7)

16  a)  Explain the debugging functions and capabilities.                          (3)

    b)  Discuss the various methods of debugging.                                   (7)

17      List the different types of editors. Explain the components of a typical text editor.  (10)

18    Explain the general design of a device driver. Differentiate between character    (10)
      and block device drivers.

19    Briefly discuss the generation of unique labels and concatenation of macro    (10)
      parameters in macro processors .

20  a)  Illustrate with an example the concept of recursive macro expansion.    (6)

    b)  Write short note on general purpose macro processors.    (4)

****