Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth semester B.Tech degree examinations (S) September 2020

Course Code: CS303
Course Name: SYSTEM SOFTWARE

Max. Marks: 100   Duration: 3 Hours

PART A
Answer all questions, each carries 3 marks.

		Marks
1	Distinguish between interpreter and compiler.	(3)
2	Explain how floating point numbers are represented in SIC/XE.	(3)
3	List the basic assembler functions.	(3)
4	Consider the statements in SIC program. Consider the program being assembled using a 2 pass assembler.	(3)

Line no	Location	Label	Opcode	Operand
10	1000	LENGTH	RESW	4
20	------------	NEW	WORD	3

What will be the address value assigned to the symbol NEW during pass 1?

PART B
Answer any two full questions, each carries 9 marks.

5   a)   What is the difference between the instructions LDA #5 and LDA FIVE? Explain   (3)
how each instruction is executed.

b)   Design an algorithm for pass 1 operations of a two pass assembler for SIC   (6)
architecture.

6   a)   Compare the following with reference to SIC and SIC/XE machines: (4)

   i.   Memory

   ii.   Instruction format

b)   Suppose the address associated with the symbol RETADR is 0030 and the   (5)
machine equivalent code for STL is 14. Assemble the given SIC/XE instruction,
by clearly indicating the instruction format, addressing mode and the setting of
different flag bits, given the address value assigned to RETADR is 0030.

Location	Label	Opcode	Operand
0000	FIRST	STL	RETADR

7 a) Suppose RECORD contains a 100-byte record. Write a subroutine for SIC that will write this record onto device 05. (5)

    b) What is a relocatable program? Do all instructions of SIC/XE machine program need modification because of relocation? Justify your answer. (4)

PART C
Answer all questions, each carries 3 marks.

8 Differentiate between control sections and program blocks with the help of an example. (3)

9 What is a load and go assembler? (3)

10 What is the use of bitmask in program relocation? Illustrate with example. (3)

11 Explain any one machine independent loader feature. (3)

PART D
Answer any two full questions, each carries 9 marks.

12 a) Give the algorithm for pass 2 of a linking loader. (5)

    b) With a help of neat diagram explain what is a linkage editor? (4)

13 a) Employ multipass assembler to evaluate the following expressions. (6)

Expression No.	Loc	Source Statement		
1		HALFSZ	EQU	MAXLEN/2
2		MAXLEN	EQU	BUFEND-BUFFER
3		PREVBT	EQU	BUFFER-1
4	4034	BUFFER	RESB	4096
5	5034	BUFEND	EQU	*

    b) Give the algorithm for an absolute loader. (3)

14 a) Give the format and purpose of the different record types present in an object program that uses multiple control sections. (4)

    b) Develop the records (excluding header, text and end records) for the following control section named COPY (5)

Loc	Source Statement		
0000	COPY	START	0
		EXTDEF	BUFFER, BUFFEND, LENGTH
		EXTREF	RDREC,WRREC
0000	FIRST	STL	RETADR
0003	CLOOP	+JSUB	RDREC
0007		LDA	LENGTH

000A		COMP	#0
000D		JEQ	ENDFIL
0010		+JSUB	WRREC
0014		J	CLOOP
0017	ENDFIL	LDA	=C 'EOF'
001A		STA	BUFFER
001D		LDA	#3
0020		STA	LENGTH
0023		+JSUB	WRREC
0027		J	@RETADR
002A	RETADR	RESW	1
002D	LENGTH	RESW	1
		LTORG	
0030	*	=C 'EOF'	
0033	BUFFER	RESB	4096
1033	BUFEND	EQU	*
1000	MAXLEN	EQU	BUFEND-BUFFER

PART E

Answer any four full questions, each carries 10 marks.

15 a) Explain the data structures and algorithm of a one pass macro-processor. (10)

16 a) What is meant by concatenation of macro parameter? (5)

b) What is conditional macro expansion? (5)

17 a) What is meant by line-by-line macro processor? What are its advantages? (5)

b) What are the important factors considered while designing general purpose macro processors? (5)

18 a) What are the functions of device drivers? (4)

b) Distinguish between character and block device drivers. (6)

19 a) Explain the overview of editing process. (5)

b) With a neat diagram show the relationship between viewing and editing buffer. (5)

20 a) Discuss the debugging functions and capabilities. (4)

b) Write down the situations where debugging by induction, deduction and backtracking are used. (6)

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