Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fifth Semester B.Tech Degree Regular and Supplementary Examination December 2020

Course Code: CS303

Course Name: SYSTEM SOFTWARE

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries3 marks. Marks

1 How is system software different from application software? (3)

2 Why is the displacement field of PC related addressing mode interpreted as 12 bit signed integer? (3)

3 Describe the functions of two passes of a simple two pass assembler. (3)

4 Assemble the following instruction indicating the instruction formats used: (3)

a. RMO S,A

b. +JSUB RDREC

c. LDA #1

Assume that the value of RDREC is 1036.

OPTAB

Opcode	Machine code
RMO	AC
JSUB	48
LDA	00

REGISTER

A	0
S	4

PART B

Answer any two full questions, each carries9 marks.

5 a) Explain the architecture of an SIC machine. (5)

b) Write an SIC/XE program to add the elements of an array ALPHA of 100 words and store the result in GAMMA. (4)

6 a) With the help of an example explain the use of BASE assembler directive. (4)

b) Explain with an example how relocation problem is handled by an assembler? (5)

7 a) Describe the data structures used by a simple two pass assembler. (5)

b) Consider the memory contents shown in the following figure (4)

.	.	(X)	000090
3030	003600	(PC)	003000
.	.	(B)	006000
3600	103000		
.	.		
6390	00C303		
.	.		
C303	003030		

What would be loaded to register A with the following instructions:

i. 03C300
ii. 022030

PART C

Answer all questions, each carries3 marks.

8 Give the purpose of following assembler directives with examples: (3)

1) USE

2) CSECT

9 Give an example of situation where the use of a multipass assembler can be justified? (3)

10 Given an idle computer with no program in memory, how do we get things started? (3)

11 Explain the concept of automatic library search. (3)

PART D

Answer any two full questions, each carries9 marks.

12 a) How are program blocks handled by the assembler? (5)

b) Using the given information, generate the machine instruction for the instruction at location 0006 and 003F. Assume that program blocks are used in the program, the machine code for LDA is 00 and STCH is 54 and the block table is as follows. (4)

Block Name	Block Number	Address	Length
(default)	0	0000	0066
CDATA	1	0066	000B
CBLKS	2	0071	1000

Loc	Block Number	Label	Opcode	Operand
0006	0		LDA	LENGTH
003F	0		STCH	BUFFER,X
0003	1	LENGTH	RESW	1
0000	2	BUFFER	RESB	4096

13 a) What do you mean by forward reference? How is forward reference handled by a One-Pass Assembler that generates object code? (5)

b) Give the pass 1 algorithm of a linking loader. (4)

14 a) What are the basic loader functions? (3)

b) Illustrate the process of dynamic linking. (6)

PART E

Answer any four full questions, each carries10 marks.

15 a) What is the difference between macro invocation and subroutine call? (3)

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

16 a) Explain macro definition and macro expansion. (4)

b) How does a one pass macroprocessor handle recursive macro expansion? Explain with example (6)

17 Explain the following machine independent macro processor features: (10)

i. Generation of unique labels.

ii. Keyword macro parameters

18 a) Describe the general design of a device driver. (5)

b) Differentiate between character and block device driver. (5)

19 With the help of a diagram describe the structure of a text editor. (10)

20 Explain the following methods of debugging: (10)

i. Induction

ii. Deduction

iii. Backtracking

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