

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S5 (S,FE) (FT/WP/S3PT) Examinations June 2026 (2019 Scheme)

**Course Code: CST305****Course Name: SYSTEM SOFTWARE**

Max. Marks: 100

Duration: 3 Hours

PART A*(Answer all questions; each question carries 3 marks)*

Marks

- | | | |
|----|--|---|
| 1 | Distinguish between System software and Application software. | 3 |
| 2 | What are assembler directives? Explain any three basic assembler directives. | 3 |
| 3 | List out the basic functions of assembler. | 3 |
| 4 | What is meant by forward reference? Give example. | 3 |
| 5 | Multiprogramming possible in SIC/XE but not in SIC machine, Justify. | 3 |
| 6 | Give the purpose of assembler directives | 3 |
| | 1)USE | |
| | 2)CSECT | |
| 7 | Give the Absolute Loader Algorithm. | 3 |
| 8 | What is relocation in loaders? Briefly explain how a relocation bit is used. | 3 |
| 9 | Write note on keyword macro parameter. | 3 |
| 10 | Explain the anatomy of device driver. | 3 |

PART B*(Answer one full question from each module, each question carries 14 marks)***Module -1**

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|----|---|---|
| 11 | a) Differentiate assembler, compiler and interpreter. | 6 |
| | b) Explain SIC Machine architecture. | 8 |
| 12 | a) Explain the functions of Loader, Linker and Macroprocessor. | 6 |
| | b) Explain different instruction format and addressing modes in SIC/XE machine. | 8 |

Module -2

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|----|--|---|
| 13 | a) Explain assembler output format and the data structures used in two pass assembler algorithm | 9 |
| | b) Let ALPHA, BETA and GAMA are arrays of 100 words each. Write an SIC program to add the corresponding elements of ALPHA and BETA and store the | 5 |

result in GAMA.

- 14 a) Explain pass one of two pass assembler algorithm. 8
b) Perform the hand assembly of the SIC program and generate the object program. 6

LABEL	OPCODE	OPERAND
PGM1	START	1000
	LDA	ALPHA
	MUL	BETA
	STA	GAMA
ALPHA	WORD	
BETA	WORD	
GAMA	RESW	
	END	1000

OPTAB is given as

OPCODE	HEXCODE
LDA	00
MUL	20
STA	0C

Module -3

- 15 a) Give the format and purpose of different record type present in an object program that use multiple control sections. 8
b) Employ multi-pass assembler to evaluate the following expressions. 6

Line No.	LOC	Source statement
1		HALFZ EQU MAXLEN/2
2		MAXLEN EQU BUFEND-BUFFER
3		PREVBT EQU BUFFER-1
4	0034	BUFFER RESW 1000
5	1034	BUFEND EQU *

- 16 a) Define Program Blocks. With an example and diagram demonstrate how the different program blocks within an assembly program and object code program for program block is organized. 8

- b) What is the difference between literal and immediate operand? Illustrate with example 6

Module -4

- 17 a) Write and explain the algorithms and data structure for pass2 of a linking Loader. 8
 b) What is dynamic linking? Explain with an example 6
 18 a) Explain machine independent loader features. 8
 b) With a neat diagram compare linking loader and linkage editor. 6

Module -5

- 19 a) Explain the data structures and algorithm of a one pass macro-processor. 7
 b) Explain the structure of text editor with diagram. 7
 20 a) Explain different debugging methods. 8
 b) Explain recursive macro expansion with example. What are the problems in recursive macro expansion. 6
