

Register No.: Name:

SAINTGITS COLLEGE OF ENGINEERING (AUTONOMOUS)

(AFFILIATED TO APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, THIRUVANANTHAPURAM)

FIFTH SEMESTER B.TECH DEGREE EXAMINATION (S), FEBRUARY 2023

COMPUTER SCIENCE AND ENGINEERING

(2020 SCHEME)

Course Code : 20CST305

Course Name: System Software

Max. Marks : 100

Duration: 3 Hours

PART A

(Answer all questions. Each question carries 3 marks)

1. List the functions of an operating system as a system software.
2. What is the difference between the instructions LDA #5 and LDA FIVE? Explain how each instruction is executed.
3. Describe the format of an assembler output with a sample object program.
4. Explain the working of the following SIC/XE instructions:
 - i) LDCH STR, X
 - ii) COMP LIMIT
 - iii) JGT LOOP
5. Explain symbol defining statement used in SIC/XE with suitable example.
6. Describe the segments available in MASM assembler.
7. Describe the first system software that is run on an idle computer.
8. What are the data structures used in a two-pass linking loader?
9. Enumerate the functions of a macro preprocessor.
10. What are the advantages of using a device driver?

PART B

(Answer one full question from each module, each question carries 14 marks)

MODULE I

11. a) Explain the architecture of a SIC machine. (7)
b) What are the various addressing modes supported by SIC/XE? With the help of an example, explain how to find target address during assembling in each case. (7)

OR

12. a) Describe the SIC/XE architecture with respect to memory, instruction formats and relative addressing modes. (10)
b) Compare the following with reference to SIC and SIC/XE machines: i. Memory ii. Instruction format (4)

MODULE II

13. a) Outline the logic flow of pass one of a two pass assembler. State the data structures used in the algorithm. (10)
- b) Assuming that the address of RDREC is 1036, assemble the following SIC/XE instructions indicating the instruction format used. (4)
- RMO S,A
+JSUB RDREC
LDA #9
- Given RMO=AC, JSUB=48, LDA=00, Register A= 0 and Register S= 4

OR

14. a) Outline the logic flow of pass two of a two pass assembler. (10)
- b) Assemble the following SIC instructions, clearly showing the instruction format. (4)

Location	Label	Opcode	Operand
1000		LDX	ZERO
		STCH	STRING, X
	STRING	RESB	4096
	ZERO	WORD	0

Given LDX=04 and STCH=54.

MODULE III

15. a) With suitable example, illustrate how parts of the program can be build, assembled and executed independent of each other? What are the additional records needed to assemble such programs? (10)
- b) How is forward reference handled in One pass assemblers? (4)

OR

16. a) With suitable example, explain how segments of code can appear in different logical order in a SIC/XE object program. Explain the assembler directive used for the same. (10)
- b) Define near jump and far jump concept. How is it handled in MASM? (4)

MODULE IV

17. a) Outline the algorithm for Pass one of a linking loader. (9)
- b) Enumerate the functions of a loader. (5)

OR

18. a) Outline the algorithm for Pass two of a linking loader. (9)

- b) List down the loader options available as machine independent feature of loaders. (5)

MODULE V

19. a) Design an algorithm to outline the working of a one pass macro preprocessor. (10)
- b) Differentiate between induction and deduction mode of debugging. (4)

OR

20. a) Explain the anatomy of a character device driver. (10)
- b) What are the functions of a text editor? (4)
