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15CS63

Sixth Semester B.E. Degree Examination, July/August 2021 System Software and Compiler Design

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

1.
 - a. Explain SIC/XE machine architecture in detail. (10 Marks)
 - b. What are the various data structures used in the design of macro processor? (06 Marks)

2.
 - a. Distinguish system software and application software. (04 Marks)
 - b. Construct the complete object code for the following assembly level program with the symbol table.
 Assume: LDA = 00, TIX = 2C, LDX = 04, JLT = 38, STA = 0C, RSUB = 4C, ADD = 18.
 Source program:

SUM	START	4000
FIRST	LDX	ZERO
	LDA	ZERO
LOOP	ADD	TABLE, X
	TIX	COUNT
	JLT	LOOP
	STA	TOTAL
	RSUB	
TABLE	RESW	2000
COUNT	RESW	1
ZERO	WORD	0
TOTAL	RESW	1
	END	FIRST

- c. What is ORG? (10 Marks)
- d. What is ORG? (02 Marks)

3.
 - a. Construct an algorithm for pass 1 of an linking loader. (10 Marks)
 - b. Explain dynamic linking with suitable example. (06 Marks)

4.
 - a. With a neat diagram, explain how object program can be processed in linking loader and linkage editor. (10 Marks)
 - b. Explain MS-DOS linker in detail. (06 Marks)

5.
 - a. Discuss the various phases of a compiler with neat diagram. (10 Marks)
 - b. Construct the transition diagram to recognize the tokens relational operators and unsigned numbers. (06 Marks)

6.
 - a. Discuss the different software productivity tools. (06 Marks)
 - b. List the algebraic laws of regular expressions. (06 Marks)
 - c. Define token and lexeme with an example. (04 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

- 7 a. Construct LL(1) parsing table for the grammar given below:
 $E \rightarrow E + T/T$
 $T \rightarrow id + T/id$ (10 Marks)
b. What are the advantages of LR parsers? (04 Marks)
c. Define operator grammar with an example. (02 Marks)
- 8 a. Outline an algorithm to find FIRST and FOLLOW. (06 Marks)
b. Show that the following grammar $S \rightarrow AaAb/BbBa$, $A \rightarrow \epsilon$, $B \rightarrow \epsilon$ is not SLR(1). Clearly mention the reasons. (10 Marks)
- 9 a. Construct annotated parse tree for $3 * 5 + 4n$ using top down approach. Write semantic rules for each step. (06 Marks)
b. Discuss the issues in the design of a code generator. (10 Marks)
- 10 a. Define inherited and synthesized attributes. (04 Marks)
b. What are three address codes? Explain different ways of representing three address code. (10 Marks)
c. Construct DAG for the following $a = a + 5$. (02 Marks)
