



P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belagavi)

Fifth Semester, B.E. - Information Science and Engineering

Semester End Examination; Dec - 2017/Jan - 2018

System Software

Time: 3 hrs

Max. Marks: 100

Note: Answer FIVE full questions, selecting ONE full question from each unit.

UNIT - I

- 1 a. Briefly discuss SIC/XE Machine Architecture. 10
- b. Write a sequence of instructions for SIC program to swap the values of ALPHA and GAMMA. 6
- c. Compare and discuss RISC and CISC machines. 4
- 2 a. Explain the features of SIC architecture. 10
- b. Write a sequence of instructions for SIC/XE to set ALPHA equal to 4*BETA-9. Use immediate addressing for the constants. 6
- c. Distinguish between system software and application software. 4

UNIT - II

- 3 a. Write a complete algorithm for pass-1 of pass-2 assembler. 12
- b. What are control sections? Explain how linking is performed between control sections? 8
- 4 a. Write the complete object codes for the following SIC/XE source codes :

SUM:	START	4000
FIRST:	CLEAR	X
	LDA	# 0
	+ LDB	#TOTAL
	BASE	TOTAL
LOOP:	ADD	TABLE, X
	TIX	COUNT
	JLT	LOOP
	STA	TOTAL
COUNT:	RESW	1
TABLE:	RESW	2000
TOTAL:	RESW	1
	END	FIRST.

Op-Codes	
LDA	00
LDB	68
ADD	18
STA	0C
JLT	38
TIX	2C
CLEAR	B4

12

- b. What do you mean by program blocks? How it works during translation of source codes to object codes? Explain with example. 8

UNIT - III

- 5 a. What are the Data structures used in linking loader? Explain algorithm of pass1 of a linking loader. 12
- b. Explain linkage editors and linking loader. 8
- 6 a. Compare and discuss SIC/XE and SIC relocation loader algorithms and also write the complete algorithms. 12
- b. Discuss dynamic linking and also explain loading and calling of a subroutine using dynamic linking. 8

UNIT - IV

- 7 a. Write the complete algorithm for a one-pass macro processor. 12
- b. Explain the following :
 i) Concatenation of Macro parameters 8
 ii) Generation of unique labels.
- 8 a. With suitable example, explain the conditional Macro expansion. 10
- b. Explain Macro Invocation and Expansion. Give examples. 10

UNIT - V

- 9 a. Explain parser-lexer communication. 10
- b. Write a LEX program to count number of lines, words, blanks and characters in a text. 10
- 10 a. Explain the general structure of LEX program and YACC program. 10
- b. List and explain any five meta characters used in LEX. 5
- c. Explain the following LEX variables :
 i) yylen ii) ECHO iii) yytext 5
 iv) yyin v) yyout.

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