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R. V. COLLEGE OF ENGINEERING

Autonomous Institution affiliated to VTU

V Semester B. E. Fast Track Examinations July-16

COMPUTER SCIENCE AND ENGINEERING

SYSTEM SOFTWARE

Time: 03 Hours ***Maximum Marks: 100***

Instructions to candidates:

1. Answer all questions from Part A. Part A questions should be answered in first three pages of the answer book only.
2. Answer FIVE full questions from Part B.

PART-A

1	1.1	The user interface of an editor is concerned with three components, _____, _____ and _____ of the system.	01
	1.2	The maximum memory size of SIC/XE machine architecture is _____.	01
	1.3	Name the byte orderings supported by $UltraSPARC$ machines.	01
	1.4	Differentiate between a literal and an immediate addressing mode.	02
	1.5	In $MASM$ assembler, by default, the assembler assumes that all references to data segments use register DS. Name the assembler directive used to change such assumption.	01
	1.6	Identify the difference between the following sequence of statements. i) $LDA\ \#3$ ii) $THREE\ EQU\ 3$ $LDA\ \#THREE$ iii) $THREE\ EQU\ 3$ $LDA\ THREE$	02
	1.7	When a computer is first turned on or restarted, a special type of absolute loader called _____ is executed.	01
	1.8	Consider the macro definition $\#define\ SQRT\ (E)\ print\ ("E = \%d\backslash n", E)$. For the macro invocation $SQRT\ (A + B)$, generate the expanded macro. Give reasons for your answer.	02
	1.9	Name and define types of loaders.	02
	1.10	Generate the object code for label $REF4$ from $PROGA$ where $REF4$ label is defined as $REF4\ WORD\ ENDA - LISTA + LISTC$ where address of $ENDA$ and $LISTA$ (in hex) are 0054 & 0040 respectively and they belong to $PROGA$. $LISTC$ ($000030\ in\ hex$) is label defined in $PROGC$ whose load address is $0040E2$.	02
	1.11	Name the record type used in $MS-DOS$ linker to support relocation and linking information.	01
	1.12	The meta character '$' matches _____.	01
	1.13	Function _____ is called by lex when input is exhausted.	01
	1.14	If the given regular expression is $0/1$, which are the following strings accepted by the regular expression $00, 01, 10, 11, 001, 010, 011, 000, 100$.	02

PART-B

2	a	Write a sequence of instructions for SIC/XE to divide $BETA$ by $GAMMA$, setting $ALPHA$ to the value of quotient and $DELTA$ to remainder. Use register to register instructions to make the calculations as efficient as possible.	06
	b	Compare the architecture of UltraSparc and Pentium pro machines with respect to memory, registers, data formats, instruction formats, addressing modes and instruction set.	10
		OR	
3	a	Explain the structure of text editor with a neat block diagram.	10
	b	Discuss the architecture of SIC with respect to: i) Addressing mode; ii) Instruction format; iii) Registers; iv) Memory; v) Data format.	06
4	a	What are program blocks? What are their advantages? Explain with an example.	08
	b	With an example, explain the working of multi-pass assembler.	08
		OR	
5	a	Explain the usage of different data structures used in pass1 of a two-pass assembler along with pass1 algorithm.	08
	b	Give the formats for the following records: i) Header record; ii) Text record; iii) Refer record; iv) Define record; v) Modification record.	08
6	a	Discuss, with an example, how program relocation is accomplished in SIC and SIC/XE.	10
	b	Differentiate between linkage editor and linking loader.	06
		OR	
7	a	Write an SIC/XE program for Bootstrap loader.	08
	b	Discuss, in detail, the different machine-independent loader features.	08
8	a	Write an algorithm for one-pass macro processor. Explain the different data structures used in designing macro processor.	10
	b	With example, explain $MASM$ macro and conditional parameters.	06
		OR	

9	a	What is conditional macro expansion? Discuss with appropriate example.	08
	b	Write short notes on: i) Keyword macro parameters; ii) Unique label generation.	08
10	a	Explain the structure of Lex program with suitable example.	05
	b	Write a $YACC$ program to validate a simple arithmetic expression involving operators $+, -, *$ and $/$.	06
	c	Write a Lex program to count the number of words in an input file.	05
		OR	
11	a	What is regular expression? Briefly explain all metacharacters used in unix regular expressions.	06
	b	With appropriate examples, explain the grammar that $YACC$ cannot parse.	05
	c	Write a note on shift reduce parsing.	05