

B.E. COMPUTER SCIENCE AND ENGINEERING THIRD YEAR FIRST SEMESTER – 2019

Subject: SYSTEM PROGRAMMING

Time: Three hours

Full marks: 100

1. a. Compare the relative advantages and disadvantages of One pass assembler over Two pass assembler. 5
- b. What are the utilities of a standard object file formats? Discuss the structure of a commonly available standard object file properly. 3+2
- OR
- i. "Instructions of 8086 can execute parallelly" - Justify it. 2+3
- ii. What are the different addressing modes of 8086 ?
- c. "The assembler could simply assume that any reference to a symbol not defined within a control section is an external reference. This change would eliminate the need for the EXTREF statement". Would this be good idea? -Justify your statement with proper examples. 5
- OR
- What is load and go assembler? How is it helpful in program development? 2+3
- d. Discuss different machine dependent and machine independent features of an assembler. 5
- OR
- i. What are the fundamental differences between SIC and SIC/XE? 2+3
- ii. List the registers of 8086 and their utilities during returning values from a function.
2. a. Design a flowchart for one-pass assembler mentioning all the data structure and steps clearly. 10
- OR
- Write the algorithm of Two-pass assembler mentioning all the data structure clearly.
- b. What is the utility of multi-pass assembler? 4
- OR
- How does assembler deal with relocatable address?
- c. What are the benefits of using different control sections? 2+4
- Analyze the following assembly program using One pass assembler to translate into its object program. Also show the generated symbol table

NEG4	CONST	-23
NUM5	CONST	43
DATA1	SPACE	
	READ	DATA1
LOOP	LOAD	DATA1
	BRZERO	EXIT
	BRNEG	MINUS
PLUS	MULT	NUM5
	BR	ANYONE
MINUS	MUT	NEG4
ANYONE	STORE	DATA1
	BR	LOOP
EXIT	STOP	

3. a. What is macro? How does it differ from a subprogram? 2+3

OR

In which situations will you use macro over subprogram? Justify with proper examples. 5

- b. Build a simple macro processor without nested definitions and calls. Explain all the data structures and steps clearly with proper flow diagram. 10
- c. What are the utilities of LOCAL and PURGE directives? 5

OR

Write the instructions to concatenate two strings through macro. Describe about different conditional directive used in MACRO. 2+3

4. a. Compare the similarities and dissimilarities between linkage editor and linker-loader. 5

OR

What is a bootstrap loader? How does it works? 2+3

- b. Explain the linking process for the object file x, y and z for which the section tables are shown below. Also, show the layout of the final executable module. 7

Name	size	Align	Name	size	Align	Name	size	Align
.text	305	16	.text	200	16	.text	75	4
.data	59	4	.data	175	4	.data	89	4
.data1	65	4	.data1	300	4	.data1	76	16
Section table for x			Section table for y			Section table for z		

- c. What is dynamic linking? How does it works? Explain with proper diagram. 3+5

5. a. Distinguish between a simple assembler and a cross assembler. Do you think that cross assembler is indispensable for system development? 3+2

OR

5

Briefly summarize the common edit control features available for text editor.

- b. Show the piece of tables after each of the following sequence of editing over the original string: "The distinction between the two categories is made based upon the smallest unit that can be edited". 8
- i. Delete the word "distinction"
 - ii. Insert the word "wonderful" between "two" and "categories"
 - iii. Insert the word "difference" at the place where "distinction" was stored earlier
 - iv. Change the word "edited" to "deleted"

OR

Write an assembly language program for 8086 to find the number of Vowels, Consonants, Digits and White space in a string. String should be taken from the user. 8

- c. What is TSR programming? How do you use TSR programming to develop device driver? 2+5

OR

Draw the proper diagram of keyboard entry process to ASCII generation showing every steps and describe it. 7