

B.E. COMPUTER SCIENCE AND ENGINEERING THIRD YEAR FIRST SEMESTER – 2018

Subject: SYSTEM PROGRAMMING

Time: Three hours

Full marks: 100

Question no 1 is compulsory. Answer any 4 questions from the rest

1.
 - a. What are the differences between positional parameter passing and key word parameter passing in macro? 3
 - b. How does a programmer decide whether to use a macro or a subroutine to accomplish a given logical function? 3
 - c. How does DLL work on windows platform? 3
 - d. Is inclusion of “#pragma inline” mandatory to run a set of assembly language statements in C program? Justify with proper example. 3
 - e. How can a one-pass assembler handle branch to an external symbol? 3
 - f. What is the utility of relocation bit? 2
 - g. What do you mean by Forward Reference and Cross Reference? 3

2.
 - a. How will you design a macro processor with nested definitions and calls? Explain with proper flow diagram. 15
 - b. Write a macro to find the maximum of 10 numbers using SIC/8086? 5

3.
 - a. Briefly describe the different data structure of two-pass linker-loader with proper diagram. How MS-DOS linker follows the data structure? Describe with appropriate examples. 7+8
 - b. Write the instruction(s) in 8086 to take input from keyboard without any echo. 2
 - c. Differentiate between REP and REPT directive with proper example. 3

4.
 - a. What are the advantages and disadvantages of holding symbolic operation codes in a separate symbol table? 4
 - b. Why does not an assembler have to calculate the addresses of array element? 3
 - c. Immediate operands and literals are both ways of specifying an operand value in a source statement. What are the advantages and disadvantages of each? When might each be preferable to the other? 4+4
 - d. What is the utility of multi-pass assembler? Describe with appropriate example. 5

5. Consider the following hypothetical assembly program segment :

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```

MAIN          START
              BALR          10,0
              USING        *,10
              L             5,=F'4'
              SER          6,6
              L             4,0(0,1)
              L             6,4(0,1)
CYCLE         LE          2,0(0,4)
              LE          4,0(0,6)
              MER          2,4
              AER          6,2
              A             6,F'4'
              A             4,=F'4'
              BCT          5, CYCLE
              L             4,8(0,1)
              STE          6,0(0,4)
              END          MAIN
    
```

For this the instruction and instruction formats are shown below

Mnemonic	Operand	Opcode	Format
BALR	R1,R2	06	RR
L	R1,D2(X2,B2)	58	RX
SER	R1,R2	3B	RR
LE	R1,R2	78	RX
MER	R1,R2	3C	RR
AER	R1,R2	3A	RR
A	R1,R2	5A	RR
BCT	R1,D2(X2,B2)	46	RX
STE	R1,D2(X2,B2)	70	RX

Show the following tables using the above program

- I. Symbol Table
- II. Literal table
- III. The change in base register table
- IV. Generated machine(Mnemonic) instruction and
- V. The generated hexadecimal code for machine instruction

6. a. What are the differences between the line editor and screen editor? Provide appropriate examples for both categories. 3+3
- b. What are the components of Text editor? Explain role of individual components. 7
- c. How will you use TSR programming to develop a device driver? Explain with example. 7