Ex/CSE/T/313/12/2014

Bachelor of Computer Science & Engg. Examination, 2014

(3rd Year, 1st Semester)

SYSTEMS PROGRAMMING

Time: 3 hours

Full Marks: 100

All Questions are to be answered in the same Answer script

Answer Question No. 1 and

ANY TWO questions each from GROUP-A and GROUP-B

Answers to different parts of same question must be contiguous

1.

a. Describe the utilities of Page and Title directives with appropriate examples.

b. Describe different directives related to defining data in both conventional and MASM 6.0 way.

c. How are different flag registers affected during execution of SHLD and MUL instructions?

d. Write the instructions to check whether caps lock is on or off.

e. What data structures are used by macroprocessor? Mention their contents.

f. What is the problem with First Come First Served scheduling algorithm?

g. Specify the differences between a linking loader and a linkage editor.

3+2+3+2+5+2+3

GROUP - A

2.

a. Describe the features of the following functions for INT 16H with proper example

(i)11H ii) 12H iii) 05H iv) 10H

b. Describe the utilities of INT 09h and Keyboard buffer with proper diagram during taking an input from a keyboard.

c. Identify the responsibilities of different registers of 8086 during execution of an instruction.

2X4+6+6

3.

a. Describe the utilities of different flag registers available in 8086 processor.

b. Describe different indirect memory addressing modes of 8086 with appropriate examples.

c. Differentiate among the debug instructions G, P and T.

d. Write the set of instructions in debug to move the contents of a memory location to another memory location.

e. Write a set of instructions to check Alt, Shift and Ctrl status from the BIOS data area.

4+4+3+2+7

4.

a. Write an assembly language program to implement recursive Fibonacci series.

b. Write an assembly language program to calculate the LCM of four numbers.

8+12

5.

a. Write the utilities of scan code.

b. How do you convert an .exe file into .com file format?

c. Differentiate between these two instructions with proper examples:

(i) IF/IFE (ii) IF/IFNDEF

d. Write an assembly language programming to generate two arrays from a given array such that one array A(j) consists of all numbers in ascending order and the other array D(j) consists of all numbers in descending order.

2+2+4+12

GROUP - B

6.

a. Consider the following snippet of code:

```
        ........
        K       DW      8
        P       DW      7
        MOV     CX, K
        MOV     BX, P
        CMP     CX, BX
        JGE     HI
LET:    ADD     AX, [SI]
        INC     SI
        LOOP    LET
HI:     XOR     AX, BX
        ........
```

What types of references are "HI" and "LET"? Justify your answer.

b. Assume that you have a two-pass assembler. Clearly mention the steps to be followed by the assembler as it encounters the above code snippet.

c. How will references like "HI" be processed if you have a one-pass "Load-and-Go" type assembler?

d. Explain lexical analysis with example.

4+8+3+5

7.

a. What is a compiler? What are the different steps in compilation?
b. What are "relocating loaders"? Who will provide relocation information? How is this achieved?
c. With respect to the above code snippet mention the statements in the object program that will require relocation information. Justify your answer.
d. What are the disadvantages of a one-pass macroprocessor?

(1+4)+(2+1+4)+5+3

8.

a. What are the advantages and disadvantages of static unequal fixed memory partitioning?
b. How is dynamic memory partitioning done? What are the problems associated with it? How can the problems be addressed? Does this lead to disadvantage? How?
c. How does the scanner work?

5+(4+3+2+1+3)+2

9.

a. How does macroprocessor handle nested macro definitions?
b. How will a macroprocessor handle a macro call within a macro definition? *Assume that the* called macro is defined earlier.
c. What is process? Describe Process State Diagram.

6+7+(2+5)