Bachelor of Computer Science &Engg. Examination, 2013

(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 utility of LOCAL directive with proper example.
b. Differentiate between AAD and DAA with proper example.
c. Write the constraint of writing a macro Library.
d. Differentiate between directive and instruction.
e. Describe the BIOS data area of a keyboard.
f. Describe the set of instructions to set typematic delay of keyboard.
g. What are the tasks of a loader?
h. What is dynamic linking? What type of loader will be required for dynamic linking?
i. What are the constraints of designing a one-pass macroprocessor?
j. What are the disadvantages of a one-pass assembler?

1+2+1+1+3+2+2+4+2+2

GROUP – A

2.

a. Describe the different types of BIOS related interrupts and functions for keyboard with their corresponding task.
b. Explain the difference between logical shift and arithmetic shift. Where are these used?
c. Describe the utilities of #pragma inline and purge directive.
d. Write a program in assembly language for comparison of two strings. Strings should be taken from user. Use sufficient comments with the program. 5+3+4+8

3.

a. Describe the utilities of the following command in Debug environment with proper example
   a) G
   b) M
   c) R
   d) W
   e) T
b. Describe the name of different data items which are supported by Debug environment.
c. Write a program to convert a 16 bit binary data into its equivalent BCD number. The binary data should be taken from the user with all constraint. 2*5+2+8

4.

a. Describe the different addressing modes of 8086 with proper example.

b. Differentiate among real, protected and virtual mode addressing.

c. Write a program to generate two arrays from a given array such that one array P(j) consists of all positive numbers and N(k) consist of all negative numbers. Main array should be taken from the user. 6+6+8

5.

a. Describe the utilities of different memory model for computer with respect to different assembly language environment.

b. Identify the responsibilities of different registers which are associated during returning different types of variables from a function.

c. Describe the methodology to run multi-file programming in MASM environment.

d. Write an assembly language procedure to reverse a string. Use the procedure to write a program to check whether a given input string is Palindrome or not. 4+3+3+10

GROUP - B

6.

a. How does lexical analysis take place? Explain with the help of an example.

b. Why is grammar required for compilation?

c. "A compiler may have both machine-dependent and machine-independent features." Comment

d. What does a linkage editor do? What should be the inputs to a relative or relocating loader? How does a linking loader perform its tasks? 4+3+3+(3+3+4)

7.

a. Consider the following program:

```
        LDA 2022H
        MOV C, A
        SUB A
        LXI H, 2024H
HERE:   ADD M
        INX H
        DCR C
        JNZ HERE
        STA 2500H
        HLT
```

How will a 2-pass assembler assemble this program? What type of reference is used in this program? Mention the contents of different variables and tables handled by the assembler.

b. What type of loader would be ideal for the above program? Why?

c. How is forward reference handled by one-pass assembler (both types)? (5+1+4)+3+7

8.

a. Mention the different data structures (and their contents) used by a macroprocessor.

b. Which memory allocation technique allows best fit policy? What are the advantages and disadvantages of best fit allocation?

c. What are the disadvantages of static fixed equal size memory partitioning technique? Explain how these disadvantages are removed in static fixed unequal size memory partitioning technique and the other disadvantages this technique brings. 6+(1+4)+(3+3+3)

9.

a. Suppose an assembly language program contains a macro definition followed by the assembly program that contains a call to that macro. What will be the steps of generating machine code for this program?

b. What will be the consequences in Round Robin scheduling policy if: i. time quantum is too small,
ii. time quantum is too large?

c. What are the advantages and disadvantages of First Come first Served (FCFS) scheduling policy?

d. What is compaction? Why is it considered to be a costly affair? 5X4