Ex/CSE/T/313/47/2011

BACHELOR OF COMPUTER SCIENCE & ENGG. EXAMINATION, 2011

(3rd Year, 1st Semester)

SYSTEMS PROGRAMMING

Time : Three hours Full Marks : 100

Answer to question No. ***1*** is compulsory

Answer any ***two*** questions from question nos. 2,3,4,5 and any ***two*** questions from questions nos. 6,7,8,9.

1. a) Describe the utilities of Real mode, Protected mode, Virtual mode operating system. 3

   b) Describe different memory models of 8096. 3

   c) Describe different types f keys within a standard keyboard. 4

   d) What are the advantages and limitations of Shortest Job First (SJF) algorithm? What kind of scheduling is SJF? 4+1

   e) What does an op-code table contain? 3

   f) What is a process? 2

2. a) Explain the working of a “two-pass” assembler with repect to the following program fragment :

[Turn Over]

```
PRGI  SEGMENT
    OPR1 DW   10
    OPR2  DW    07
    RSLT  DW     ?
ASSUME CS : PRGI, DS : PRG1
    STRT : MOV AX, CS
           MOV   DS , AX
           MOV  AX, OPR1
           ADD  AX, OPR2
           JGE    LP
           NEG   AX
  LP:      MOV  RSLT , AX
           HLT
  PRG1    ENDS
         END   STRT
```

b) How is a forward reference in “one -pass” assembler? In what ways is it different from forward reference handling of a “two-pass” assembler? 15+5

3. a) What is meant by linking?

b) What are the differences between macro and directive? Give proper examples each.

c) Write an 8086 assembly language program to implement merge sort 20 numbers. The numbers will be taken as user input. (provide sufficient comments.) 4+4+12

9. a) Describe the methodology to create assembly language library with proper example.

b) Write an 8086 assembly language program to add three strings. The strings will be taken as user input. (provide sufficient comments). 10+10

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b) Waht are the tasks of a linking loader? What are its advantages and disadvantages?

c) How does a linkage editor work?

d) What is the advantage of an absolute loader? Give an example of an absolute loader (if any).

e) What are the disadvantages of a “two-pass” assembler with respect to a “ one-pass” assembler?

3+(3+4)+4+3+3

4. a) Define the following terms : response time, waiting time throughput

b) Calculate the turnaround time of each process using. (i) First Come First Serve Serve (FCFS)and (ii) Shortest Job First (SJF) seheduling algorithms and compare the results:

Process	Arrival Time	Execution time
A	0	7
B	3	3
C	4	8
D	7	4

c) What is lexical analysis? Is language grammar required during this phase? 6+10+4

5. a) How and where is a macro definition stored? Assume that the macro has a list of parameters associated with it.

b) How will a macro processor handle a macro call with parameters? What is the output of a macro processor?

c) Who will provide information to the loader regarding the program to execute? What may be these information?

d) What are the steps in compilatrion. 5+(5+2)+(1+2)+5

6. a) Write an 8086 assembly language program to sum the factorials of n user given numbers.

b) Write an 8086 assembly language program to calculate GCD of 10 double digit numbers (Provide sufficient comments on each program). 10+10

7. a) Write the utilities of local directives with example.

b) Write a set of instructions to set typematic delay and repeat delay.

c) Describe the string related instructions of 8086.

d) Describe different keyboard buffer related input/output functions with corresponding interrupts. 5+3+6+6

8. a) Describe different types of indirect addressing modes with proper examples.