BACHELOR OF COMPUTER SC. ENGG. EXAMINATION, 2009
(3rd Year, 1st Semester)

SYSTEMS PROGRAMMING

Time: 3 hours Full Marks: 100

Answer **Question No. 1** and
Any **SIX (6)** questions from the rest

1.
a. What should be the goals of designing an operating system?
b. What is loading?
c. Describe Based index displacement indirect addressing mode with an example in 8086 assembly language.
d. What are the differences between Debug and MASM?

3+2+3+2

2.
a. How you can insert a block of assembly language code in C programming language?
b. Describe the utility of #pragma
c. What are the characteristics of the different memory models of 8086?
d. Describe instructions LEA and SAR with suitable example

3+3+5+4

3.
Write the process of executing multifile programming in MASM with proper example

15

4.
a. In Debug is it possible to write a program in file? If yes describe the process.
b. Describe different data types in MASM.
c. Describe the utilities of *near* and *far* pointer in assembly language

5+4+6

5.
Write a program to display the transpose of a matrix. The matrix size and input should be taken as user input.

15

6.
a. Write a program in 8086 assembly language for selection sort.
b. Describe the differences between direct and indirect addressing mode in 8086 assembly language

10+5

7.

a. Calculate turnaround time of each process (from the following information) using Round Robin scheduling (RR) algorithm: (Time slice: 3 time units)

Process	Arrival Time	Execution time
P0	0	7
P1	1	2
P2	2	13
P3	3	5
P4	4	9

(Turnaround time: total time from arrival till end of execution)
(Show the Gantt chart. Mention clearly the policy used if time slice is not utilized fully.)

b. Mention the advantages of static unequal-size partitioned memory allocation technique.

c. What are the disadvantages of variable-size dynamic partitioned memory allocation technique?

8+3+4

8.

a. Give an idea of the output of the assembler for the following snippet of code:

```
        N     DW   8
        A     DW   4
        MOV   CX, N
        MOV   BX, A
        CMP   CX, BX
        JGE   GO
CONT:   ADD   AX, [SI]
        INC   SI
        LOOP  CONT
GO:     XOR   AX, CX
```

b. What will be the difference in working among a "two-pass", "one and a half-pass" and a "single-pass" assembler? Explain with the help of the above mentioned code.

7+8

9.

a. How does a linking loader work?

b. What is the difference between static linking and dynamic linking?

c. What are the advantages and disadvantages of RR scheduling?

5+4+6

10.

a. What is lexical analysis?

b. When do you require grammar during compilation? How does it help?

c. What do you mean by *semantics* of programming language? Is a grammar capable of capturing *semantics*?

5+(2+4)+4

11.

a. Explain the steps followed for executing a high-level language program

b. Suggest an example scenario in which Round Robin (RR) scheduling behaves similar to First Come First Served (FCFS) scheduling. Justify your answer.

c. What is linkage editor? State its advantages and disadvantages.

6+4+5