COMP 5-6 (RC)

T.E. (Computer) (Semester – V) Examination, Nov./Dec. 2009
(Revised Course)
OPERATING SYSTEMS

Duration : 3 Hours | Max. Marks : 100

Instructions: *i) Answer **five** full questions by selecting at least **one** from **each** Module.*
*ii) Make appropriate assumptions **wherever** necessary.*
*iii) Write answers in the **same** sequence of questions.*

Module – 1

1. a) Define the essential properties of the following with respect to operating systems
   i) Batch ii) Interactive 4

   b) Under what circumstances would a user be better of using a time sharing system rather than a PC or a single user workstation. 4

   c) What are threads ? Explain the various thread models. 4

   d) Consider a set of 2 periodic tasks with the execution profile given below. 8

Process	Arrival Time	ExecutionTime	Ending deadline
A(1)	0	10	20
A(2)	20	10	40
A(3)	40	10	60
A(4)	60	10	80
A(5)	80	10	100
B(1)	0	25	50
B(2)	50	25	100

P.T.O.

Develop a scheduling diagram using

1) Fixed priority scheduling, where A has higher priority

2) Fixed priority scheduling, where B has higher priority

3) Earliest deadline scheduling using completion deadline

2. a) Consider a system that executes the following processes using Round Robin algorithm with a time slice of 4 ms 8

Process	Arrival Time	Processing Time
A	0	3
B	1	5
C	3	2
D	9	5
E	12	5

1) Draw a chart to illustrate the execution schedule.

2) What is the wait time for each process ?

3) What is the average wait time ?

b) Explain the producer consumer problem and give a solution to infinite buffer producer consumer problem using Binary semaphore. 8

c) Explain the following terms with respect to operating systems : 4

1) Convoy effect

2) Graceful degradation

Module – 2

3. a) Give any three mechanisms to recover from a deadlock 6

   b) What is segmentation ? How is sharing of segments done in a segmented memory system ? 8

   c) Explain how a page fault is handled. 6

4. a) Explain Fetch, Placement and Replacement policy. 6

   b) Discuss Resident set management. 8

   c) Consider the following snapshot of the system. 6

   Using bankers algorithm

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	0	1	0	7	5	3	3	3	2
P1	2	0	0	3	2	2			
P2	3	0	2	9	0	2			
P3	2	1	1	2	2	2			
P4	0	0	2	4	3	3			

   1) What is the content of the matrix need ?

   2) Is the system in a safe state ?

Module – 3

5. a) Explain in brief different directory structure. 8

   b) What is polling ? Explain. 4

   c) Explain I/O Scheduling with respect to LINUX. 8

6. a) List two disk scheduling techniques and differentiate. 8

b) How is swap space used ? Where is it located on the disk ? 4

c) Write a short note on windows I/O manager. 4

d) Explain the process of Disk formatting. 4

Module – 4

7. a) Explain the nature of viruses and explain different types of viruses. 10

b) Explain UNIX password protection technique. 5

c) Given a string "Operating system" 5

i) Find the length of the string

ii) Display the last two characters of the string

iii) Find the position of the character "e" in the given string.

8. a) Write a shell script to generate the following pattern 5

```
        1
      2   2
    3   3   3
  4   4   4   4
5   5   5   5   5
6   6   6   6   6   6
7   7   7   7   7   7   7
```

b) Using shift statement and command line arguments write a shell script to search 6 different patterns in a file. If pattern is found then display the corresponding line if not display a message as pattern not found. 10

c) What is a digital Immune System ? 5