Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/BCA/SEM-3/BCA-301/2010-11

2010-11

OPERATING SYSTEM

Time Allotted : 3 Hours Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

   i) What is a shell ?

      a) It is a hardware component

      b) It is a command interpreter

      c) It is a part of compiler

      d) It is a tool in CPU scheduling.

   ii) Virtual memory is

      a) an extremely large main memory

      b) an extremely large secondary memory

      c) an illusion of extremely large storage provision

      d) a type of memory used in super computers.

iii) Multiprogramming systems

a) are easier to develop than single programming systems

b) execute each job faster

c) execute more jobs in the same time

d) are used only on large main frame computers.

iv) Which is not the state of the process ?

a) Blocked b) Running

c) Ready d) Privileged.

v) The number of processes completed per unit time is known as

a) Output

b) Throughput

c) Efficiency

d) Capacity.

vi) A critical region

a) is a piece of code which executes only one process at a time

b) is a region prone to deadlock

c) is a piece of code which executes only a finite number of process

d) is found only in Windows NT operation system.

vii) The mechanism that bring a page into memory only when it is needed is called

a) Segmentation

b) Fragmentation

c) Demand Paging

d) Page Replacement.

viii) PCB stands for

a) Program Control Block

b) Process Control Block

c) Process Communication Block

d) None of these.

ix) The Banker's algorithm is used

a) to prevent deadlock in operating systems

b) to detect deadlock in operating systems

c) to rectify a deadlocked state

d) none of these.

x) FIFO scheduling is

a) Preemptive scheduling

b) Non-preemptive scheduling

c) Deadline scheduling

d) Fair share scheduling.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Explain PCB with a neat diagram.

3. Explain multilevel feedback queue.

4. Explain the difference between process and program.

5. What do you mean by critical regions ?

6. What is the difference between a long-term schedulers and a short-term scheduler ?

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Define a process. Describe the life cycle of a process.

   b) What do you mean by synchronization with respect to Inter Process Communication ?

   c) Define context switch. (2 + 4) + 5 + 4

8. a) What do you understand by race condition ? Give few examples of arising of race condition in concurrent processing.

   b) Suppose that the following processes arrive for execution at the time indicated :

Process	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

   What is the average waiting time for these processes with –

   i) FCFS scheduling algorithm.

   ii) SJF scheduling algorithm.

   iii) RR scheduling algorithm.

   c) What is the importance of an interrupt in scheduling ?

(3 + 2) + 6 + 4

9. a) Consider the following snapshot of a system :

	Allocation	Max	Available
	A B C D	A B C D	A B C D
P_0	0 0 1 2	0 0 1 2	1 5 2 0
P_1	1 0 0 0	1 7 5 0	
P_2	1 3 5 4	2 3 5 6	
P_3	0 6 3 2	0 6 5 2	
P_4	0 0 1 4	0 6 5 6	

Answer the following questions using the banker's algorithm.

i) What is the content of the matrix need ?

ii) Is the system in a safe state ?

iii) If a request from process P_1 arrives for (4, 2, 0) can the request be granted immediately ?

b) Write the difference between partition allocation and multiple partition allocation.

c) Under what conditions do page faults occur ? 10 + 3 + 2

10. a) What is critical section problem ? Explain with a suitable example.

b) What is semaphore ? Write down the algorithm, using semaphore to solve producer-consumer (Finite lubber) problem.

c) Write down the problem with disable interrupts.

11. Write short notes on any *three* of the following : 3 × 5 = 15

i) Virtual Machine

ii) Monitor

iii) Thrashing

iv) Distributed OS

v) RAID.