Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/BCA/SEM-3/BCA-301/2012-13

2012

OPERATING SYSTEMS

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 : $10 \times 1 = 10$

i) Multiprogramming is

a) single program executing on a machine

b) more than one program executing on a machine

c) single program executing on more than one machines

d) more than one program executing on multiple machines.

ii) In the memory hierarchy of operating system, ... is the fastest accessible memory.

a) CPU register b) Disk

c) Main memory d) Cache memory.

iii) In ..... mode, machine is executing operating system instructions.

a) User b) System

c) Safe d) Normal.

iv) The surface of floppy disk is made of concentric circles called

a) Sectors b) Records

c) Blocks d) Tracks.

v) The aim of I/O scheduling is

a) reducing seek time

b) reducing processing time

c) reducing read time

d) none of these.

vi) SSTF stands for

a) shortest seek time factor

b) shortest seek time first

c) shortest storage time factor

d) none of these.

vii) ..... is used by the operating system to store information about a process.

a) DCB

b) Disk memory

c) PCB

d) TCB.

viii) The time elapsed between the job submission and its completion is

a) Response time

b) Waiting time

c) Terminal response time

d) Turnaround time.

ix) When the memory wastage is within the partition itself, it is called

a) Compaction

b) External fragmentation

c) Internal fragmentation

d) Worst fit.

x) Address generated in segmentation is ..... dimensional.

a) one b) two

c) three d) five.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. What do you mean by critical section ?

3. Describe thrashing. Explain the demand paging in memory management scheme. 2 + 3

4. Explain multilevel queue scheduling.

5. What is virtual memory ?

6. What is fragmentation ? Describe briefly.

GROUP – C
(Long Answer Type Questions)

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

7. a) What is process ? Explain Process State and Process Control Block.

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

Process	***Arrival Time***	***Burst Time***	***Priority***
P0	0	5	2
P1	2	7	4
P2	3	9	1
P3	3	4	5
P4	4	3	3

   Draw the Gantt chart and calculate the average waiting for

   i) FCFS scheduling algorithm

   ii) Priority scheduling algorithm

   iii) Preemptive SJF scheduling algorithm

   iv) RR scheduling algorithm. 1 + (3 + 3) + 8

8. What are the conditions for deadlock ? Describe a system model for deadlock. Explain Resource allocation graph algorithm for deadlock avoidance. Discuss deadlock recovery technique. 4 + 3 + 4 + 4

9. What is semaphore ? How can semaphore be used to enfore mutual exclusion ? Explain Producer-Consumer problem. Explain Dining Philosopher problem. 4 + 3 + 4 + 4

10. a) Consider the following resource allocation state involving processes P0, P1, P2, P3, P4 and P5 and resources R0, R1, R2 and R3 :

Process	Allocation				Max				Available			
	R0	R1	R2	R3	R0	R1	R2	R3	RO	R1	R2	R3
P0	1	0	0	2	2	3	5	3	1	2	3	3
P1	0	0	2	0	2	1	3	5				
P2	1	0	3	0	1	2	3	2				
P3	1	2	3	4	2	3	3	6				
P4	1	0	0	3	2	4	5	6				
P5	0	1	3	2	3	5	7	8				

Answer the following questions using banker's algorithm.

i) What is the content of matrix need ?

ii) Is the system in a safe state ?

iii) If a request from process P1 arrives for (5, 2, 7 9) can the request be granted immediately ?

b) Differentiate process switching and context switching.

c) Under which condition does page fault occur ?

10 + 3 + 2

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

a) Scheduler

b) Remote procedure call

c) Monitor

d) Distributed OS

e) Virus and Worms

f) File access methods.