



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.*

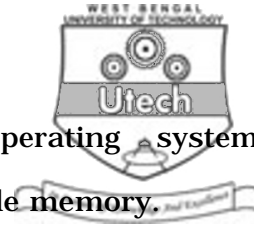
**GROUP - A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following :

10 × 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.

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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.  $3 \times 5 = 15$

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.  $3 \times 15 = 45$

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 :

<b>Process</b>	<b>Arrival Time</b>	<b>Burst Time</b>	<b>Priority</b>
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 enforce 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.
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