



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 :  $10 \times 1 = 10$ 
  - 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.

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- 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 scheduler and a short-term scheduler ?



**GROUP – C**

**( Long Answer Type Questions )**

Answer any *three* of the following.  $3 \times 15 = 45$

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 ?  
 $( 3 + 2 ) + 6 + 4$

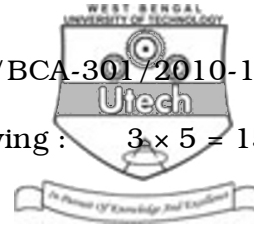


9. a) Consider the following snapshot of a system :

	Allocation	Max	Available
	A B C D	A B C D	A B C D
P <sub>0</sub>	0 0 1 2	0 0 1 2	1 5 2 0
P <sub>1</sub>	1 0 0 0	1 7 5 0	
P <sub>2</sub>	1 3 5 4	2 3 5 6	
P <sub>3</sub>	0 6 3 2	0 6 5 2	
P <sub>4</sub>	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<sub>1</sub> 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 :  $3 \times 5 = 15$

- i) Virtual Machine
  - ii) Monitor
  - iii) Thrashing
  - iv) Distributed OS
  - v) RAID.
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