

**B.E / B.TECH DEGREE EXAMINATIONS: APRIL/MAY 2014**

(Regulation 2009)

Fifth Semester

**CSE112: OPERATING SYSTEMS**

(Common to CSE/IT)

**Time: Three Hours**

**Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 1 = 10 Marks)**

1. The primary job of the operating system of a computer is to \_\_\_\_\_.  
a) Command Resources                      b) Manage Resources  
c) Provide Utilities                          d) Be user friendly
2. Information about a process is maintained in a \_\_\_\_\_.  
a) Stack    b) Translation Look aside Buffer  
c) Process Control Block                      d) Program Control Block
3. In Priority CPU Scheduling, the problem of Starvation is resolved by \_\_\_\_\_.  
a) Terminating the process                      b) Aging  
c) Mutual Exclusion                              d) Semaphore
4. \_\_\_\_\_ is a high level abstraction over Semaphore.  
a) Shared memory                              b) Message passing  
c) Monitor    d) Mutual exclusion
5. A computer system has 6 tape drives, with 'n' processes competing for them. Each process may need 3 tape drives. The maximum value of 'n' for which the system is guaranteed to be deadlock free is  
a) 2    b) 3  
c) 4    d) 1
6. In a paged memory, the page hit ratio is 0.35. The time required to access a page in secondary memory is equal to 100 ns. The time required to access a page in primary memory is 10 ns. The average time required to access a page is  
a) 3.0 ns    b) 68.0 ns  
c) 68.5 ns    d) 78.5 ns
7. In which of the following page replacement policies Belady's anomaly occurs?  
a) NRU    b) LRU  
c) LFU    d) FIFO
8. Virtual memory is \_\_\_\_\_.  
a) An extremely large main memory      b) An extremely large secondary memory

- c) An illusion of extremely large main memory      d) A type of memory used in super computers.
9. Which directory implementation is used in most Operating System?  
a) Single level directory structure              b) Two level directory structure  
c) Tree directory structure                      d) Acyclic directory structure
10. The time taken by the disk arm to locate the specific address of a sector for getting information is called \_\_\_\_\_.  
a) Rotational Latency                              b) Seek Time  
c) Search Time                                      d) Response Time

**PART B (10 x 2 = 20 Marks)**

11. What is the responsibility of medium term scheduler?
12. What is meant by distributed systems?
13. What are threads? Why are they are required?
14. What is bounded waiting in critical section?
15. Differentiate contiguous and non contiguous memory allocation.
16. What are the four necessary conditions a system should posses in order to be termed as deadlock?
17. What are the advantages and disadvantages of demand paging?
18. What is meant by thrashing?
19. List any four features of LINUX operating system.
20. What is a bit vector?

**PART C (5 x 14 = 70 Marks)**

21. a) (i) Discuss briefly the various issues involved in implementing inter process communication in message passing system. (10)  
(ii) Describe the actions taken by a kernel to context switch between processes (4)
- (OR)**
- b) List and discuss the types of system calls provided by OS under process control, file manipulation and device manipulation
  22. a) Consider the following Processes, burst time, arrival time

Process	Burst Time (ns)	Arrival Time
P1	9	0
P2	6	0
P3	3	0
P4	4	0
P5	2	4
P6	1	6

Calculate the following using FCFS, SJF, SRTF, Round Robin (Timeslice = 2ns)

1. Draw the grant chart.
2. Calculate average waiting time
3. Calculate average turnaround time

**(OR)**

- b) (i) How do semaphores help to implement mutual exclusion? (8)
- (ii) What is a race condition? Explain how a critical section avoids this condition. (6)

List the properties of a data item that are required to implement a critical Section.

23. a) (i) Consider the following processes (8)

	Allocation			Max			Available		
	A	B	C	A	B	C	A	B	C
P0	1	3	0	1	5	3	1	4	2
P1	0	2	0	2	2	5			
P2	1	0	1	2	4	2			
P3	0	1	1	0	6	4			
P4	0	0	1	1	4	4			

Check whether the above state is safe or not

- (ii) Diagrammatically illustrate and explain internal and external fragmentation (6)

**(OR)**

- b) (i) Give five memory partitions of 100kb, 500kb, 200kb, 300kb and 600kb in order. (6)

How would each of the first, best and worst fit algorithms place processes of 212kb, 417kb, 112kb and 426kb? Which algorithm makes the most efficient use of memory?

- (ii) Discuss about the paging concept. (8)

24. a) Consider the following page reference string.

1, 2, 3, 4, 2, 1, 5, 6, 2, 1, 2, 3, 7, 6, 3, 2, 1, 2, 3, 6

For three page frames, how many page faults are generated by the above reference string by using LRU, optimal page replacement & FIFO page replacement algorithms?

**(OR)**

- b) Explain various file directory structures and compare merits and demerits.

25. a) Suppose that a disk drive has 5000 cylinders numbered 0-4999. The drive is currently serving a request at cylinder 143, and the previous request was at 125. The queue of pending request order is 86, 1470, 913, 1774, 948, 1509, 1022, 1750, 130 starting from the current head position, what is the total distance in cylinders that the disk arm moves to satisfy all the pending request for each of the following algorithm– FCFS, SSTF, SCAN, LOOK.

**(OR)**

- b) (i) Describe components of a Linux system (8)
- (ii) Explain the following file allocation methods. (6)
- (i) Linked allocation (ii) indexed allocation

\*\*\*\*\*