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Question Paper Code: 41325

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2016

Third Semester

Computer Science and Engineering

14UCS305 - OPERATING SYSTEMS

(Regulation 2014)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 1 = 10 Marks)

1. A process can affect or be affected by other process is said to be
 - (a) Co-operating process
 - (b) Independent process
 - (c) Time sharing process
 - (d) None of these
2. The Multithreading model multiplexes many user-level threads to a smaller or equal number of kernel threads
 - (a) One to One
 - (b) One to Many
 - (c) Many to One
 - (d) Many to Many
3. Lack of process synchronization leads to a situation called
 - (a) Belady anomaly
 - (b) Fragmentation
 - (c) Starvation
 - (d) Race condition
4. Which time is the sum of the periods spent waiting to get into memory, waiting in the ready queue, executing on the CPU, and doing I/O.
 - (a) Turnaround time
 - (b) Waiting time
 - (c) Response time
 - (d) Throughput
5. Consider a logical address space of eight pages of 1024 words each mapped onto a physical memory of 32 frames. How many bits are in Logical Address?
 - (a) 10
 - (b) 12
 - (c) 13
 - (d) 15

6. What does Belady's anomaly related to
- (a) Memory management algorithm (b) Page replacement algorithm
(c) Disk scheduling (d) Deadlock prevention
7. If the disk head is located initially at 32, find the number of disk moves required with FCFS if the disk queue of I/O blocks request are 98, 37, 14, 124, 65, and 67 .
- (a) 239 (b) 321 (c) 310 (d) 325
8. Consider a disk with 10 blocks, where blocks 1, 4, 6, 8, 10 are free and the rest are allocated. The free space bit map would be
- (a) 1001010101 (b) 1010100101
(c) 1001010111 (d) 0110101010
9. _____ allows modules to tell the rest of the kernel that a new driver has become available.
- (a) Module management (b) Conflict resolution
(c) Driver registration (d) All the above
10. The design goals of Windows include (i) Extensibility (ii) Reliability (iii) Portability (iv) compatibility.
- (a) (i) and (ii) only
(b) (ii) and (iii) only
(c) (i) , (ii) and (iii) only
(d) (i) , (ii), (iii) and (iv)

PART - B (5 x 2 = 10 Marks)

11. List the goals of operating system.
12. Describe the various operations of semaphores.
13. Differentiate internal and external fragmentation.
14. Bring out the difference between SCAN and C-SCAN disk scheduling.
15. What do you meant by I-node?

PART - C (5 x 16 = 80 Marks)

16. (a) (i) Diagrammatically illustrate and discuss the various states of a process. (6)
(ii) Explain how memory, I/O and CPU protection is achieved. (10)

Or

(b) (i) Explain in detail the various multithreaded models. (6)

(ii) Explain about Inter Process Communication. (10)

17. (a) Consider the following processes. Illustrate the scheduling using Gant chart for FCFS, preemptive SJF, non preemptive Priority Find the average waiting time and average turnaround time.

<i>Process</i>	<i>Burst time (ms)</i>	<i>Arrival Time (ms)</i>	<i>Priority</i>
<i>P1</i>	4	2	4
<i>P2</i>	2	1	1
<i>P3</i>	5	0	2
<i>P4</i>	3	3	3

(16)

Or

(b) Consider the following snapshot of a system:

<i>Process</i>	<i>Allocation</i>				<i>Max</i>				<i>Available</i>			
	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>
<i>P0</i>	0	0	1	2	0	0	1	2	1	5	2	0
<i>P1</i>	1	0	0	0	1	7	5	0				
<i>P2</i>	1	3	5	4	2	3	5	6				
<i>P3</i>	0	6	3	2	0	6	5	2				
<i>P4</i>	0	0	1	4	0	6	5	6				

Answer the following question using banker's algorithm: (i) what is the content of the need matrix? (ii) Is the system in a safe state? (iii) If the request from process *P1* arrives for (0, 4, 2, 0), can the request be granted immediately. (16)

18. (a) (i) With neat diagram, Explain the process of segmentation. (8)

(ii) Explain in detail demand paged memory management. (8)

Or

- (b) Consider the following page reference string: 1, 2, 7, 8, 3, 4, 2, 1, 4, 2, 5, 6, 1, 2, 7, 8. How many page faults would occur for the following page replacement algorithm, assuming an allocation of 5 frames?
- (i) FIFO replacement
 - (ii) Optimal replacement
 - (iii) LRU replacement (16)

19. (a) Discuss in detail the directory structure implementation with necessary examples. (16)

Or

- (b) (i) Describe the various disk allocation methods with its merits and demerits. (10)
 - (ii) How reliability and protection is provided in a file system. (6)
20. (a) Compare and contrast the features of Windows and LINUX operating system. (16)

Or

- (b) (i) State and discuss the basic principles of process management in LINUX operating system. (8)
- (ii) Describe the file system of Windows in detail. (8)