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|-----|---|---|---|---|
| 9. | All routines are kept on disk in a relocatable load format. The main program is loaded into memory and is executed whenever needed. This is called ____ | 1 | 2 | 3 |
| | (A) Dynamic linking (B) Dynamic loading | | | |
| | (C) Static linking (D) Static loading | | | |
| 10. | _____ is a condition, where there is enough total memory space to satisfy a request but the available spaces are not contiguous | 1 | 2 | 3 |
| | (A) First fit (B) Internal fragmentation | | | |
| | (C) External fragmentation (D) Segmentation | | | |
| 11. | _____ are the two techniques that permit the logical address space of the processes to be noncontiguous, thus allowing a process to be allocated with physical memory wherever such memory is available | 1 | 2 | 3 |
| | (A) Segmentation and Compaction (B) Paging and Compaction | | | |
| | (C) Fragmentation and Paging (D) Segmentation and Paging | | | |
| 12. | In segmentation, each address is specified by _____ | 1 | 1 | 3 |
| | (A) Segment number & offset (B) Offset & value | | | |
| | (C) Value & segment number (D) Key & value | | | |
| 13. | The situation where the processor spends most of its time swapping process pieces rather than executing instructions is called: | 1 | 2 | 3 |
| | (A) Paging (B) The Principle of Locality | | | |
| | (C) Thrashing (D) Swapping | | | |
| 14. | The LRU page replacement policy can be implemented using _____ | 1 | 1 | 3 |
| | (A) Counters (B) Stack & Counters | | | |
| | (C) RAM & Registers (D) Registers | | | |
| 15. | Which is a technique to efficiently copy data resources in a computer system? | 1 | 1 | 4 |
| | (A) Copy-on-write (B) Swapping | | | |
| | (C) Thrashing (D) Paging | | | |
| 16. | The _____ is the additional time for the disk to rotate the desired sector to the disk head | 1 | 2 | 4 |
| | (A) Bandwidth (B) rotational latency | | | |
| | (C) seek time (D) Storage-area network | | | |
| 17. | Which of the following commands is used to set the change the file permissions | 1 | 1 | 5 |
| | (A) log (B) dir | | | |
| | (C) chmod (D) passwd | | | |
| 18. | In the _____ algorithm, the disk arm goes as far as the final request in each direction, then reverses direction immediately without going to the end of the disk. | 1 | 2 | 5 |
| | (A) LOOK (B) SCAN | | | |
| | (C) C-SCAN (D) C-LOOK | | | |
| 19. | Free space list cannot be implemented as | 1 | 1 | 5 |
| | (A) Bitmap (B) Grouping | | | |
| | (C) Indexed (D) Counting | | | |
| 20. | In indexed allocation _____ | 1 | 2 | 5 |
| | (A) each file must occupy a set of contiguous blocks on the disk (B) each file is a linked list of disk blocks | | | |
| | (C) all the pointers to scattered blocks are placed together in one location (D) none of the mentioned | | | |

PART - B (5 × 4 = 20 Marks)

Answer **any 5** Questions

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| 21. | Explain the different operations on processes with an example for each. | 4 | 2 | 1 |
|-----|---|---|---|---|

22. Discuss in detail on critical section problem	4	2	1
23. Differentiate the Internal fragmentation problem with the External Fragmentation problem. Give an example for each.	4	4	2
24. Describe the relationship between effective access time and the page fault rate	4	4	3
25. Illustrate the Working set Model in Thrashing.	4	3	4
26. List and discuss briefly about various file attributes.	4	2	5
27. Discuss on how the free space list is maintained in storage disks.	4	4	5

PART - C (5 × 12 = 60 Marks)

Answer all Questions

28. (a) Describe in detail about Dining Philosophers problem with code snippet. (OR) (b) Discuss how the Inter-process communication mechanism helps in message passing for cooperating processes to exchange messages.	12	2	1
29. (a) Five batch jobs, A through E, arrive at a computer center at essentially the same time. They have an estimated running time of 15, 9, 3, 6, and 12 minutes, respectively. Their (externally defined) priorities are 6, 3, 7, 9, and 4, respectively, with a lower value corresponding to a higher priority. For each of the following scheduling algorithms, determine the turnaround time for each process and the average turnaround for all jobs. Ignore process switching overhead. Explain how you arrived at your answers. (i) FCFS (ii) SJF (iii) Round Robin with a time quantum of 1 minute (iv) Priority Scheduling (OR) (b) Discuss in detail about the bankers algorithm with respect to (i) safety algorithm (ii) Resource-request algorithm.	12	3	2
30. (a) With a neat sketch, explain how a logical address is translated into a physical address using the Paging mechanism. (OR) (b) Explain the need for demand paging, and illustrate the steps, of how an OS handles the page faults.	12	3	3
31. (a) Consider the following page reference string 1,2,3,4,1,2,5,1,2,3,4,5. How many page faults would occur for the LRU, FIFO, and optimal page replacement algorithms, assuming four frames and all frames are initially empty? (OR) (b) Consider the following disk request sequence for a disk with 100 tracks 45, 21, 67, 90, 4, 50, 89, 52, 61, 87, 25. Head pointer starting at 50 and moving in the left direction. Find the number of head movements in cylinders using FCFS and SSTF scheduling with proper illustration. Also, find out the best algorithm for this scenario.	12	3	4
32. (a) Discuss in detail the various methods on how disk blocks are allocated for files. • Contiguous allocation • Linked allocation • Indexed allocation (OR) (b) Define RTOS. List the design issues. Explain the components of RTOS with a neat sketch.	12	4	5

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