**Unit-IV**

**One mark questions. [20]**

1. The memory is usually divided into ---- partitions.
2. What is a logical address?
3. What is a physical address?
4. Name the methods of memory allocation in OS.
5. Name the solution to the problem of external fragmentation.
6. What is the problem with best-fit memory allocation?
7. What is frame?
8. What do you mean by page table?
9. Every address generated by the CPU is divided into two parts namely ----- and -----.
10. The ----- is used as an index into a page.
11. What is the size of a page typically?
12. What is a frame table?
13. TLB stands for --------.
14. Define hit ratio.
15. A common approach for handling address spaces larger than 32 bits is to use a -----.
16. What does an inverted page table contains?
17. How to find effective access time for demand paging?
18. What will happen if we increase the degree of multiprogramming?
19. Name any two page replacement algorithms.
20. Name the page replacement algorithm that does not suffer from Belady’s anomaly.

**Two marks question. [10]**

1. What is best fit strategy for memory allocation.
2. Draw block diagram for paging hardware with TLB.
3. What is worst fit strategy for memory allocation?
4. What is 50-percent rule?
5. What is the concept of paging?
6. What is the significance of valid-invalid bit in page table?
7. What is the concept of Balady’s anomaly in page replacement algorithm?
8. What is the technique of demand paging?
9. Draw block diagram for paging hardware.
10. What is first fit strategy for memory allocation?

**Five marks questions [5]**

1. Explain about hierarchical paging.
2. What is the concept of hashed page tables?
3. Write a short note on inverted page table?
4. Explain paging concept in detail.
5. Explain Segmentation concept in detail.
6. On a system using simple segmentation, compute the physical address for each of the logical address, given the following segment table. If the address generates a segment fault, indicate so.
   1. (0,99) (ii) (2,78) (iii) (1,265) (iv) (3,222)

(v) (0,111)

|  |  |  |
| --- | --- | --- |
| **Segment** | **Base** | **Length** |
| 0 | 330 | 124 |
| 1 | 876 | 211 |
| 2 | 111 | 99 |
| 3 | 498 | 302 |

1. Consider the following page reference string1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,4,5,3. How many page faults would occur for the FIFO and LRU replacement algorithms? Assume four frames and all frames are initially empty.
2. Explain the most common techniques for structuring the page table.
3. (a) Consider a system where the number of pages is equal to 2k and the page size is 4KW. The physical address (PA) is 18 bits. Then calculate the logical address and the number of frames in the physical address space.
4. (b) Consider a system with Logical address space of 128MW and Physical address 24 bits. The physical address is divided into 8k frames. Then what is the page size and how many pages in the logical address space.

**Ten marks questions [10]**

* + 1. 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.How many page fault would occur for the following page replacements algorithms, assuming an allocation of 4 frames? Remember that frames are initially empty.

(i)LRU (ii)FIFO (iii)Optimal

* + 1. Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB( in order), how would each of the first-fit, best-fit, and worst-fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 300KB (in order) ? Which algorithm makes the most efficient use of memory?
    2. For the following reference string show the behavior of least recently used (LRU),first in first out (FIFO) and optimal OPT) page replacement algorithm when the memory contains 4 frames. 1, 2, 3, 4, 5, 3, 4, 1, 6, 7, 8, 7, 8, 9, 7, 8, 9, 5, 4, 5, 4, 2.How many page faults occur for the following page replacement algorithms, for four frames? All frames are initially empty; as a result, unique pages will cost one faulteach.
    3. With an example, explain the working of FIFO, LRU and optimal page replacement algorithms.
    4. (a)What is paging and consider a simple paging system with a page table containing 512 entries of 16 bits (including valid/invalid bit) each, and a page size of 1024 bytes, how many bits in the logical address specify the

(i)PageNumber ii) Offset within the page iii) Size of logical address space.

(b) What is Segmentation? Consider system using simple segmentation; compute the physical address for each of the logical addresses, given in the following segment table. If the address generates segment fault, indicate so.

i) 2,800 ii) 1, 600

iii) 3, 1100 iv) 1, 1111

|  |  |  |
| --- | --- | --- |
| **Segment** | **Base** | **Length** |
| 0 | 1100 | 500 |
| 1 | 2500 | 1000 |
| 2 | 200 | 600 |
| 3 | 4000 | 1200 |