PES UNIVERSITY

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Department of Computer Science & Engg

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UE19CS254: Operating Systems

UNIT 3 Question Bank and Answers

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	Chapter 8 Main Memory
1.	Define: Belady's anomaly? Ans: In computer storage, Belády's anomaly is the phenomenon in which increasing the number of page frames results in an increase in the number of page faults for certain memory access patterns. This phenomenon is commonly experienced when using the first-in first-out (FIFO) page replacement algorithm.
2.	Distinguish between page and segment. Ans: Paging is used to get a large linear address space without having to buy more physical memory. Segmentation allows programs and data to be broken up into logically independent address spaces and to aid sharing and protection.
3.	Consider the following segment table: Segment Base Length 0 219 600 1 2300 14 2 90 100 3 1327 580 4 1952 96 What are the physical addresses for the following logical addresses? a. 0,430 b. 1,10 c. 2,500 d. 3,400 e. 4,112 Solution: a. 0, 430 →219 + 430 = 649 b. 1, 10 →2300 + 10 = 2310 c. 2, 500 Illegal address since size of segment 2 is 100 and the offset in logical address is 500. d. 3, 400 →1327 + 400 = 1727 e. 4, 112 Illegal address since size of segment 4 is 96 and the offset in logical address is 112.
	Chapter 9 Virtual Memory
1.	What is demand paging and how pure demand paging is different from it. Ans: In demand paging, a page is not loaded into main memory until it is needed. In pure demand paging, even a single page is not loaded into memory initially.

	Hence pure demand paging causes a page fault. Page fault, the situation in which the page is not available whenever a processor needs to execute it.
2.	What is virtual memory and give its advantages. Virtual Memory is a storage mechanism which offers user an illusion of having a very big main memory. It is done by treating a part of secondary memory as the main memory. Advantages: The size of program can be more than the size main memory. Memory can be used efficiently because a section of program loaded only when it need in CPU. Virtual memory allows sharing of code and data, unlimited amounts of multiprogramming. We can reduce internal fragmentation using segmented paging and eliminates external fragmentation.
3.	Difference between Physical and logical address. A logical address is generated by CPU while a program is running. Since a logical address does not physically exists it is also known as a virtual address. This address is used as a reference by the CPU to access the actual physical memory location. There is a hardware device called Memory-Management Unit is used for mapping logical address to its corresponding physical address. A physical address identifies the physical location of a specific data element in memory. The user never directly deals with the physical address but can determine the physical address by its corresponding logical address. The user program generates the logical address and believes that the program is running in this logical address space, but the program needs physical memory for its execution, therefore, the logical address must be mapped to the physical address by the MMU before the addresses are used. The term physical address space is used for all physical addresses corresponding to the logical addresses in a logical address space.