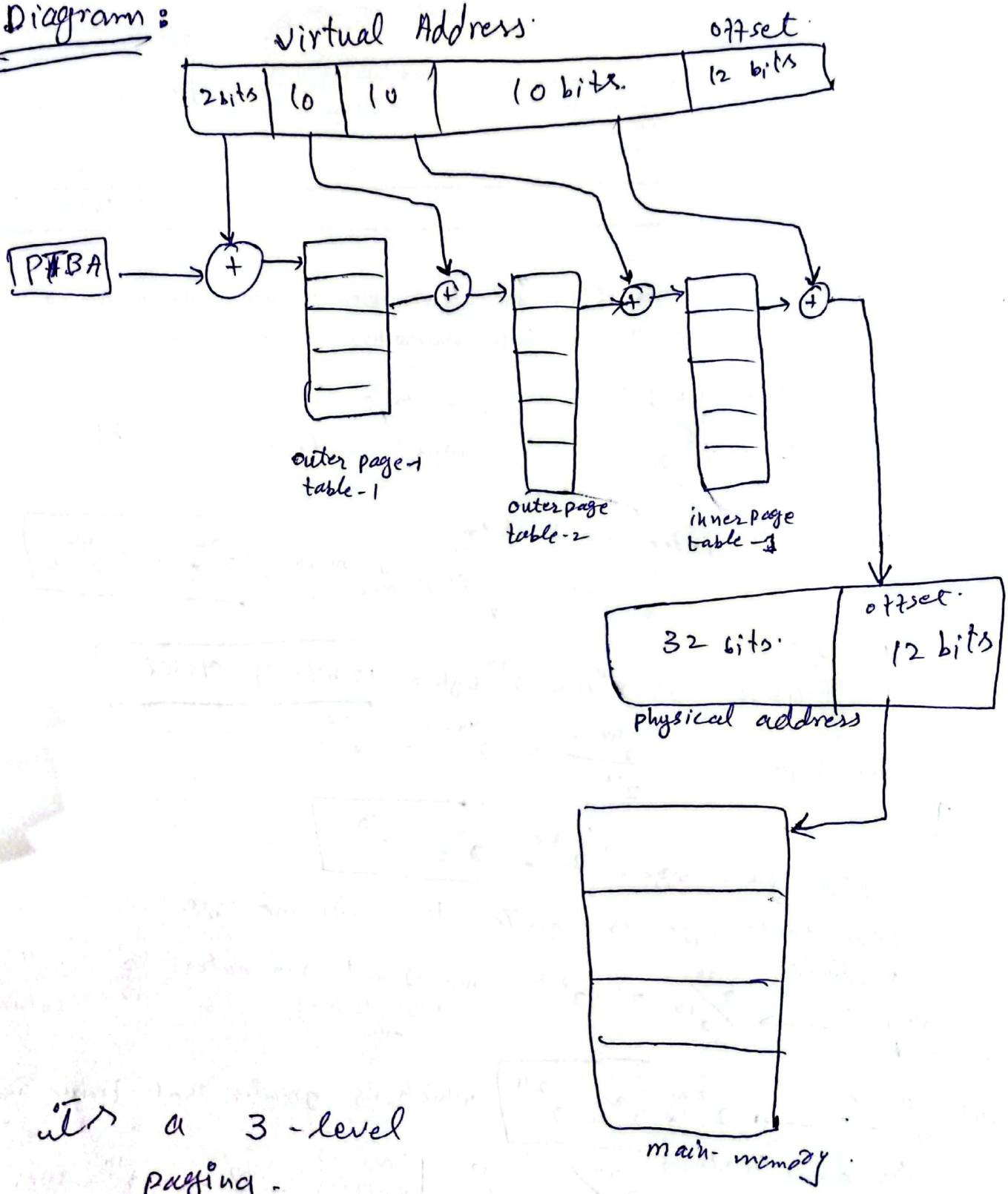
As, Page table-3 size is greater than frame size we will divide further.

$$\frac{2^{14}}{2^{12}} = 2^2$$

this Page table size $= 2^2 * 2^2 = 2^4$ which is less than frame size.

Diagram:



It's a 3-level paging.

Excellent
19/20

COMSATS University Islamabad, Lahore Campus
Department of Electrical and Computer Engineering

Quiz No 4-FALL 2024							
Course Title:	Operating System				Course Code:	CSC322	Credit Hours: 3(2,1)
Course	Engr. Ahmad Mudassir				Program Name:	BCE	
Semester:	5th	Batch:	FA22-BCE	Section:	B	Date:	26th December 2024
					Maximum Marks:		20
Student's name:	ALI HAMZA				Reg. No.	CUI/FA22-BCE-071	/LHR
Important Instructions / Guidelines: • Avoid overwriting and cutting							

Question 1: 10, 10, 10, 12,

Consider the virtual address space of 44 bits and Page table entry size is 4 bytes and Page size is 4 KB. Illustrate through diagram Page level mapping and the division in virtual address.

V.A = 44 bits , page table entry size = 4 B

V.A. Space = 2^{44} Page size = Frame size = 4KB

No. of bits of frame = 32 bits.

No. of frame = 2^{32} , size of main memory = $2^{32} * 2^{12} = 2^{44}$ B

4KB = $2^2 \cdot 2^{10}$ B = 2^{12} Byte = 12 bits of offset.

No. of pages = $\frac{2^{44}}{2^{12}} = 2^{44-12} = 2^{32}$

page table size = $2^{32} * 2^2 = 2^{34}$

page table size is greater than frame size.

So, divide $2^{34}/2^{12} = 2^{22}$ No. of entries in outer page table = $\frac{2^{12}}{2^2} = 2^{10}$ entries.

- Outer page-table-1 → 2^{22}
- Outer page table-2 → $2^{22} * 2^2 = 2^{24}$ which is greater than frame size.

So, divide further. $2^{24}/2^{12} = 2^{12}$ [No. of entries in ut. = $\frac{2^{12}}{2^2} = 2^{10}$ entries

- outer page table-3 → $2^{12} * 2^2 = 2^{14}$ = page table size