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ASSIGNMENT NO 3

Question No 1:

Address = 16 bits , Page Size = 1024 Bytes (2^{10})

a)

Bits of logical addresses

Bits for page numbers

Bits for offset

Solution

As the page size is 2^{nd} (1024) Bytes, it requires 10 bits to represent the offset within a page. So, the remaining bits in the 16 bits logical addresses will be used for page numbers. So,

Bits of logical addresses = 16 bits

Bits for page numbers = 16 − 10 = 6 bits

Bits for offset = 10 bits

(b) Entities = ?

As the page numbers is represented by 6 bits, so there are $2^6 = 64$ pages, so the page table need 2^6 entities

Entities in Page table = 2^6

c)

Page #	Page Table Entity
21	26
56	4
5	21
20	50
24	47

Logical Addresses

i) 0101101011010111 ii) 0000010110100

iii) 00010101000 iv) 0101100000010010

Physical Address =?

How many distinct entities =?

Which page table entities are they =?

Which page frame numbers do there enteries contain =?

Solution

i) Page numbers = 010110 => 22nd decimal offset =

22 decimal offset = 1011010111

As this page numbers does not exist on page table its an illegal address

ii) 1110000010110100

Page numbers = 111000 => 50 in decimal = 0010110100

As, page numbeers 50 exists in offset page table, the corresponding frame numbers is 4.

So, physical address = Frame + offset

= 0100 + 0010110100

= 01000010110100

iii) 0001010101000010010

Page numbers = 000101 => 5 in decimal

5 in decimal offset = 0100010010

As, page numbers 5 entities exists in page table the corresponding frame number = 21

So,

physical Address = Frame + offset

= 010101 + 0100010010

= 0101010100010010

iv) 0101100000010010

Page numbers = 010110 => 22 in decimal

offset = 0000010010

As, page numbers doesnot exist in the table, so its an illegal address

DISTINCT Page Entries: 4, 21

Page Table Entries:

The page table entries are 21 and 4 corresponding to the pages 5 and 56 respectively

PAGE FRAME:

For page table entry 21: Page frame number is 5.

For page table entry 4: Page frame number is 56