Assignment - 1

Operating Systems

Tarusi Mittal 1901CS65

Que 1:- Given: Capacity = 32 KB
Chips = 256 × 4 RAM chips
To find: Size of decoder required.

⇒ Capacity of memory = 32 KB = 32 × 1024 × 8 bits = 262144
$= 2^{18}$ bits

No of chips needed = $\frac{2^{18}}{256 \times 4} = 256$

Since we are using 1 byte = 8 bits as the unit, we need 2 chips per row of 256 × 4 RAM chips.
Total rows required = $\frac{256}{2} = 128$ rows

To select a row, we need $\log(128) = 7$ bits

⇒ specifications of the decoder required ⇒ 7×128.

Answer = (a) 256, 7×128

Que 2:- We know, Inverted page table is a global page table which is maintained by the operating system for all the processes. In an inverted page table, the number of entries is equal to the number of frames in main memory

Answer = (a) No of frames in main memory.

Que 3: Given: The Virtual Address Space consists = 8 segment
Each segment = 2^{29} bytes long.
The hardware pages each segment into = 2^8 byte pages
To find: How many bits in the VA specify the page no.

→ No of pages = $\frac{2^{29}}{2^8} = 2^{21}$

So to accomodate 2^{21} bits required = 21

Answer (d) 21

Que 4: 3 bits are required to uniquely identify segment no.
as $8 = 2^3$

Answer = (b) 3

Que 5: There are 8 segment in the Virtual address space and each is 2^{29} bytes long

So: total addressable space of VM = $8 \times 2^{29} = 2^{32}$

⇒ Bits required = 32

Answer = (d) 32

— x — x — x — x — x — x — x — x —