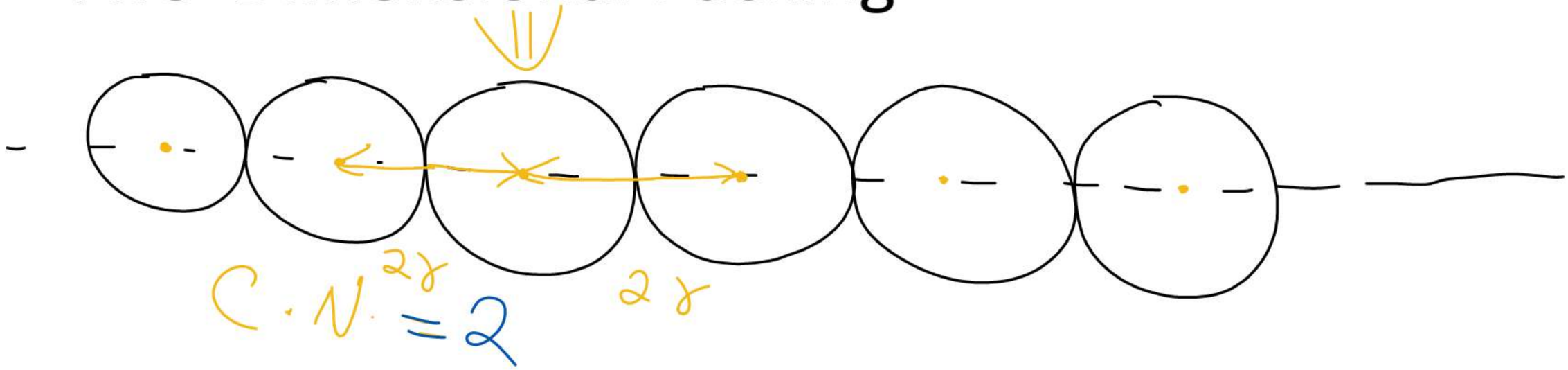
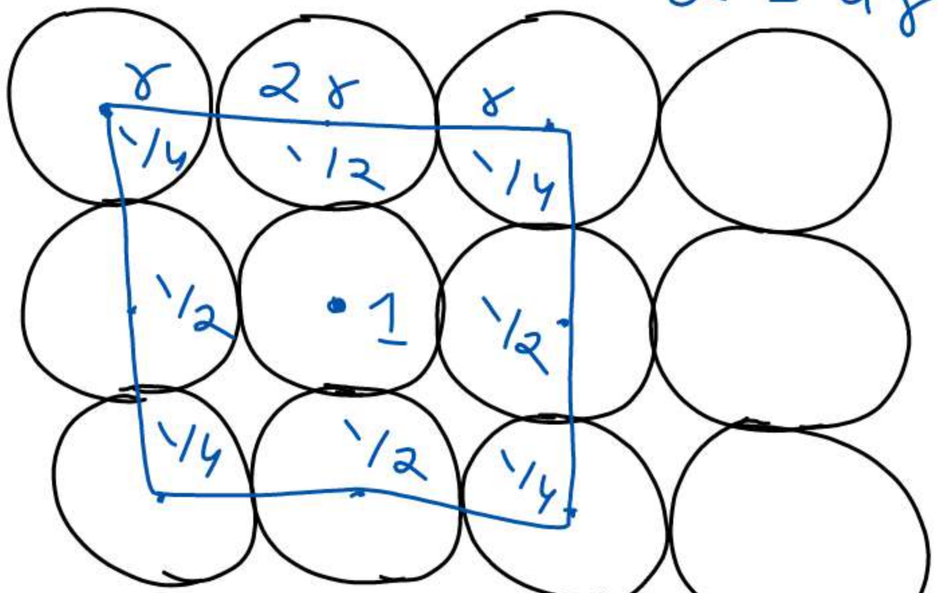
- <u>CLOSE PACKING:</u>
- Two Dimensional Packing



- <u>CLOSE PACKING:</u>
- Two Dimensional Packing



Square Void C.N. = 4

Z =

① Square close Packing.

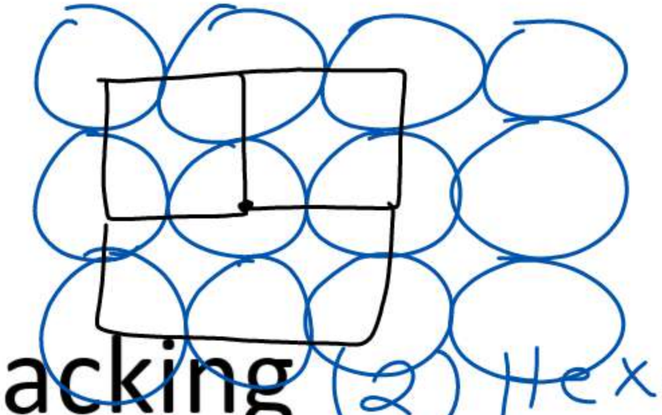
$Z = 4 \times \frac{1}{4} + 4 \times \frac{1}{2} + 1 \times 1$

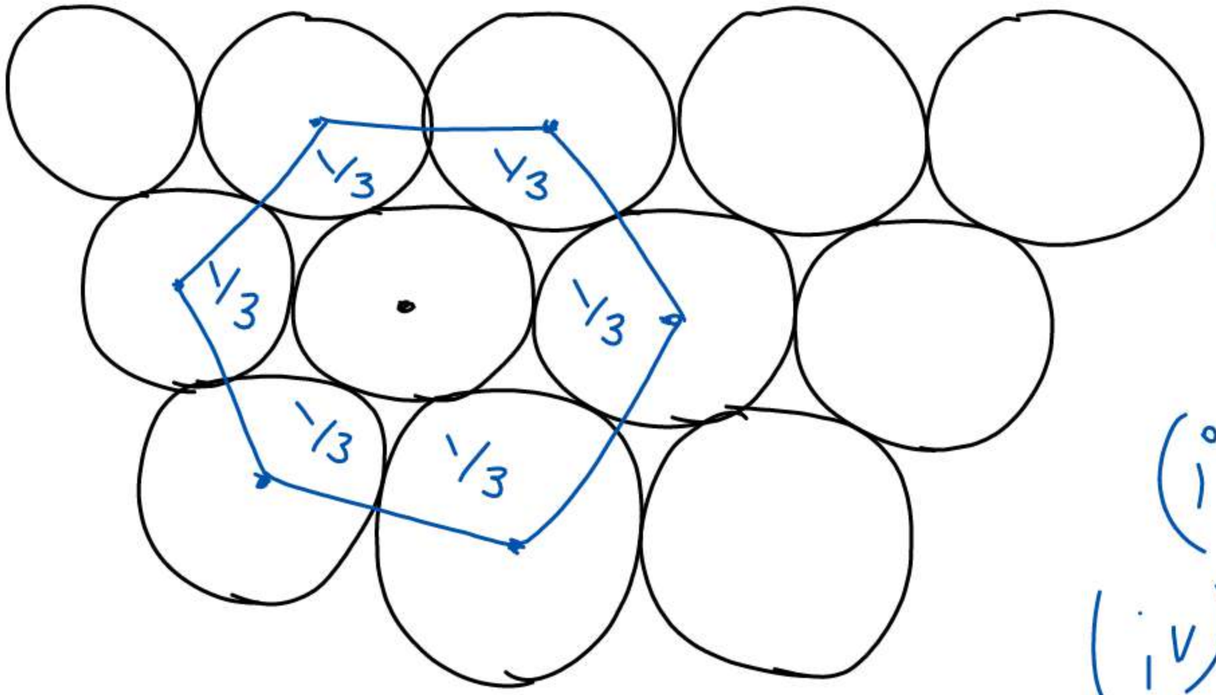
$Z = 1 + 2 + 1 \Rightarrow \boxed{Z = 4}$

$P.E/P.F = \frac{Z \times \frac{4}{3}\pi r^3}{a^3} = 60.4\%$

$= \frac{4 \times \frac{4}{3}\pi r^3}{a^3} = \frac{4 \times \frac{4}{3}\pi r^3}{4r \times 4r \times 4r} \times 100$

- <u>CLOSE PACKING:</u>
- Two Dimensional Packing





(2) Hexagonal close Packing.

(i) C.N. = 6

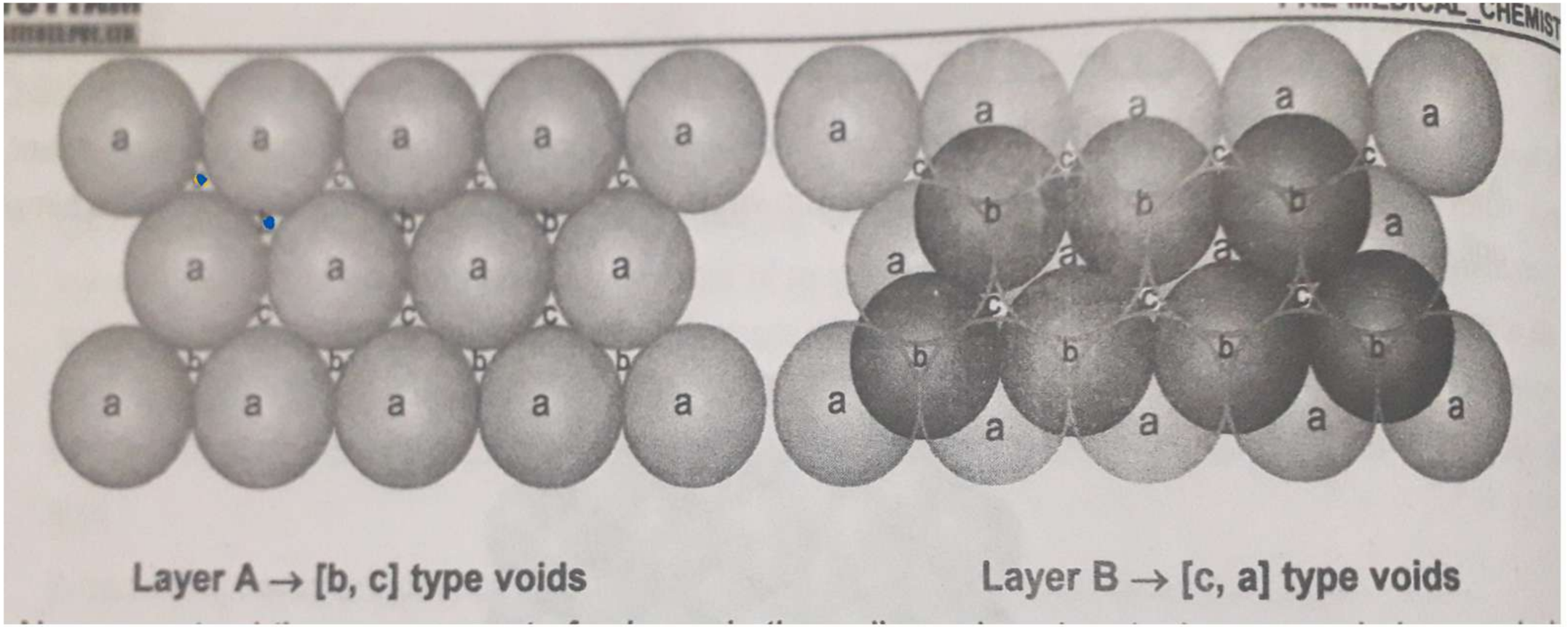
(ii) $Z = 6 \times \frac{1}{3} + 1 \times 1$

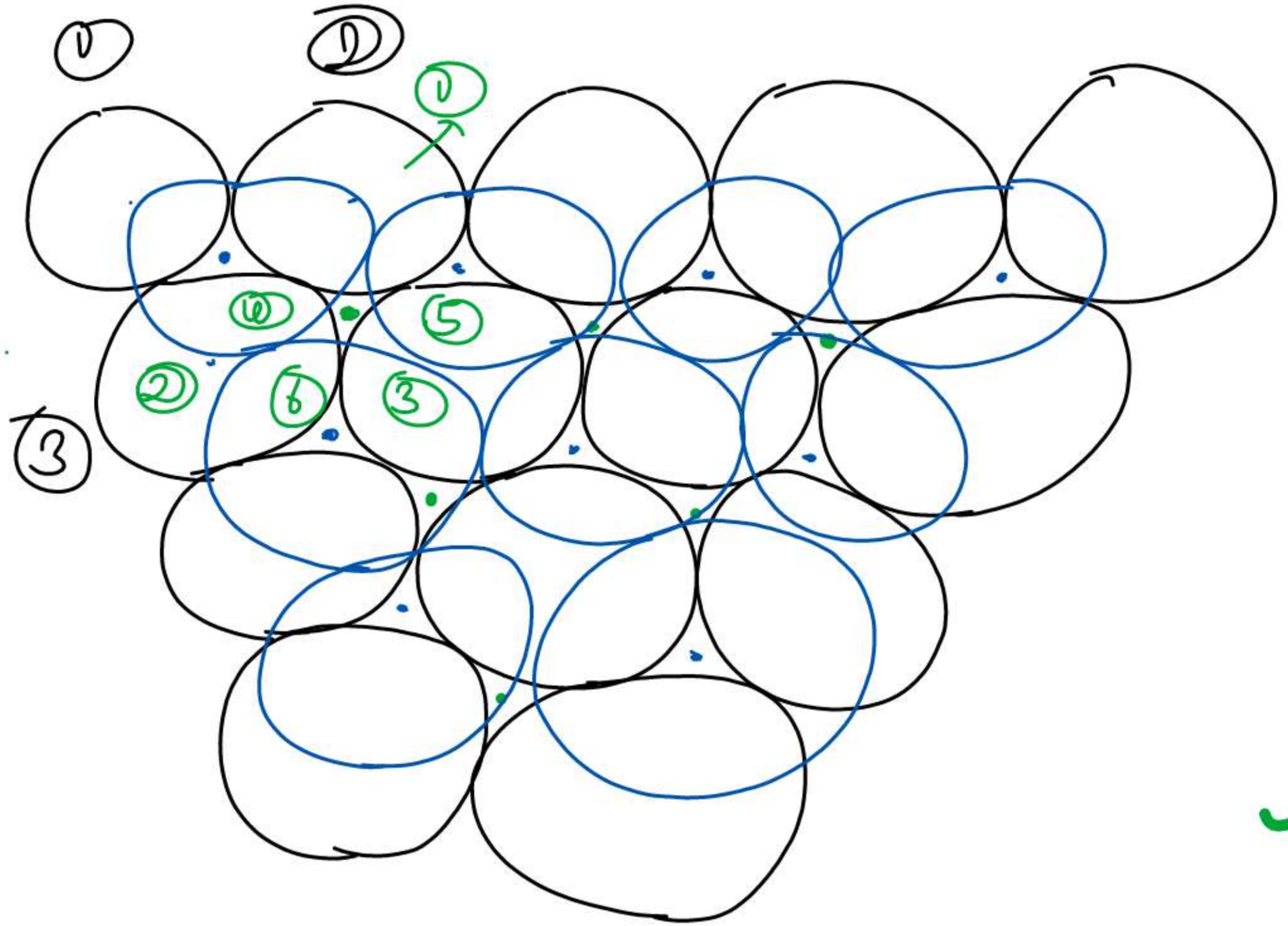
$Z = 2 + 1 = 3$

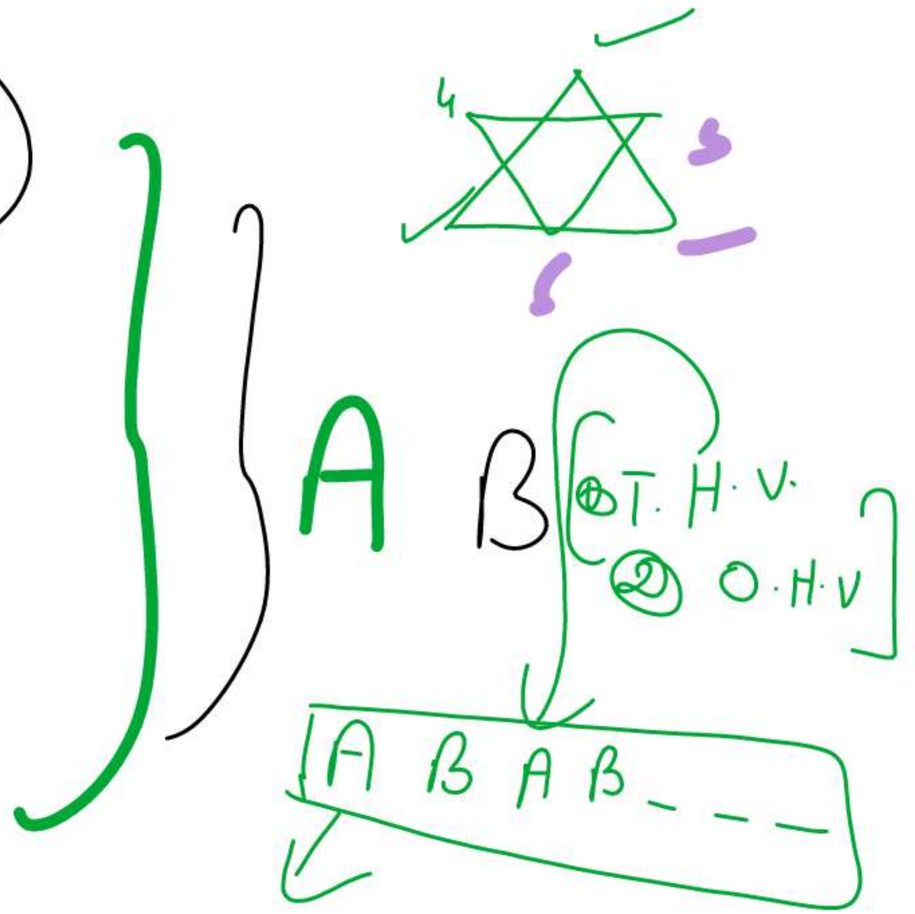
(iii) Packing efficiency = 60.5 %

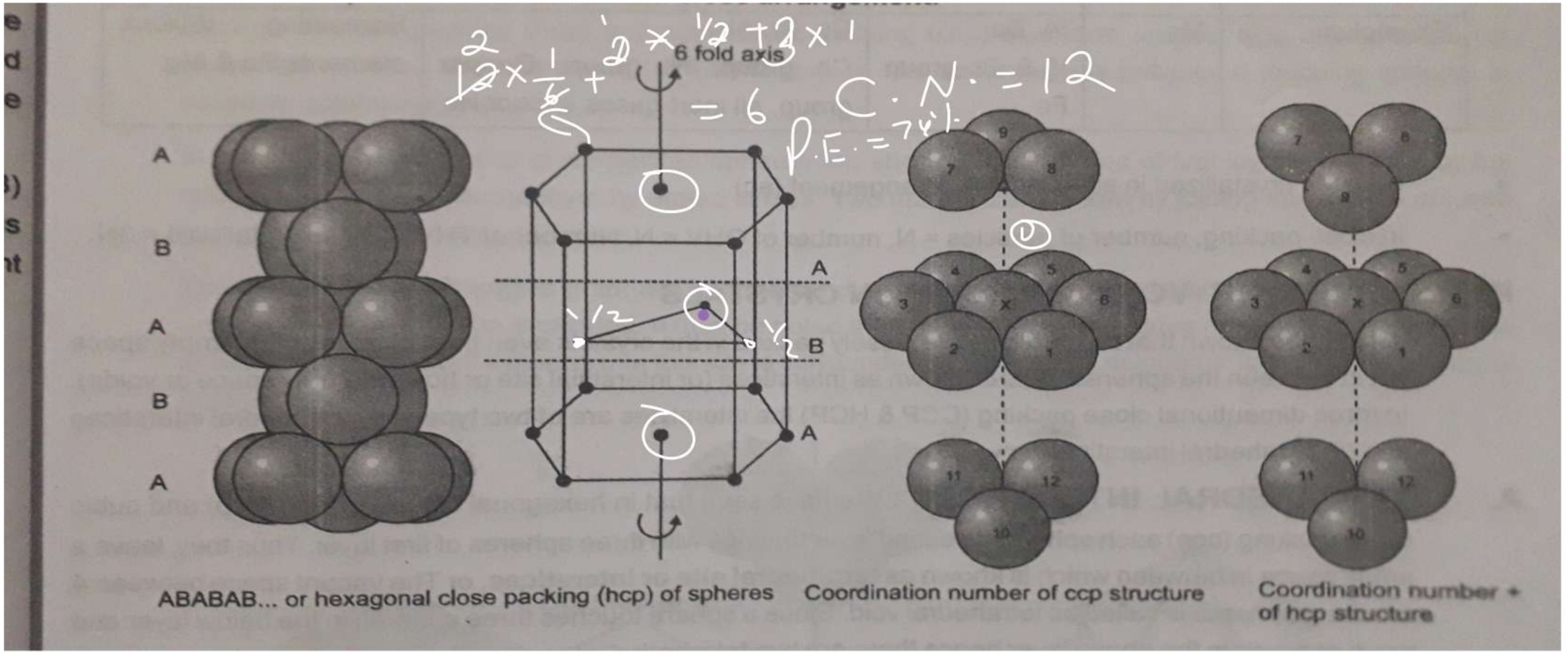
(iv) Triangular Void.

- CLOSE PACKING:
- Three Dimensional Packing




1
2
1
4
5
6
2
6
3
3


4
A
B
T · H · V ·
2 O · H · V
A B A B _ _ _

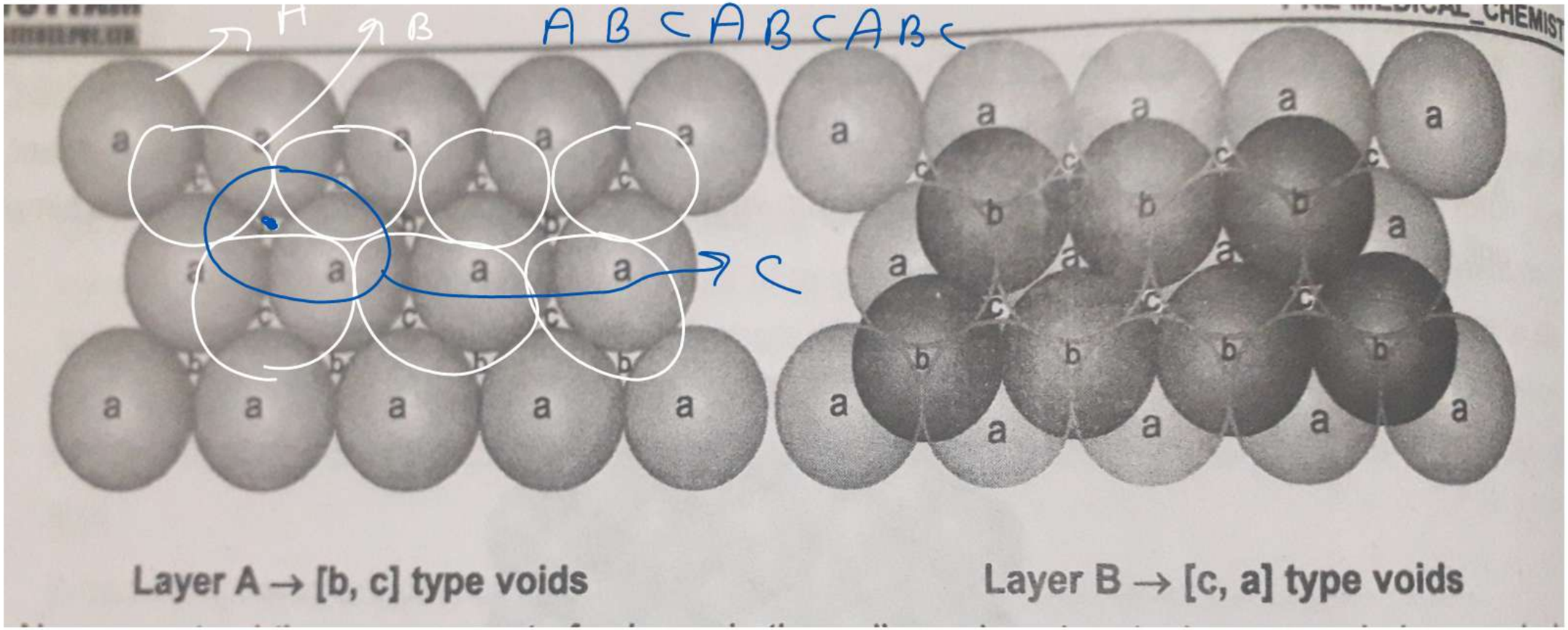


ABABAB... or hexagonal close packing (hcp) of spheres

Coordination number of ccp structure

Coordination number of hcp structure

- CLOSE PACKING:
- Three Dimensional Packing



V. V. imp.

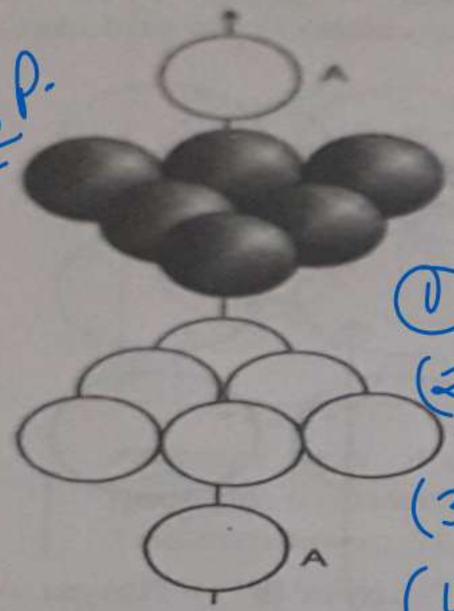
CCP / Face Center Cubical Close Packing.

(1) $Z = 4$

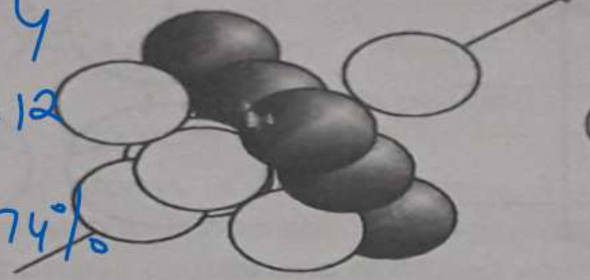
(2) C.N. = 12

(3) P.E. = 74%

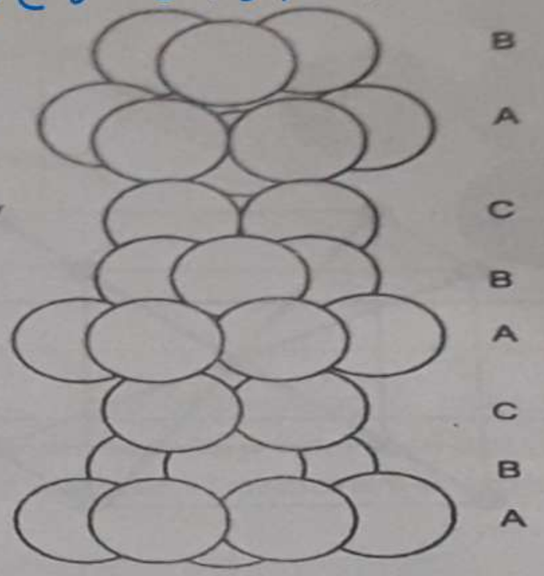
(4) $4r = \sqrt{2}\,a$

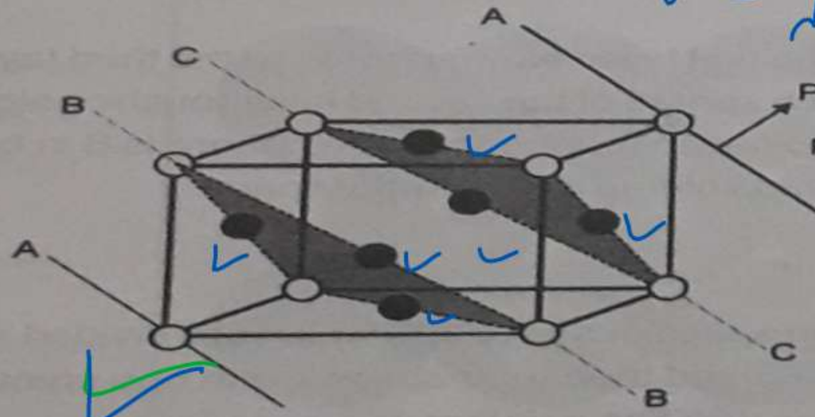


Exploded view

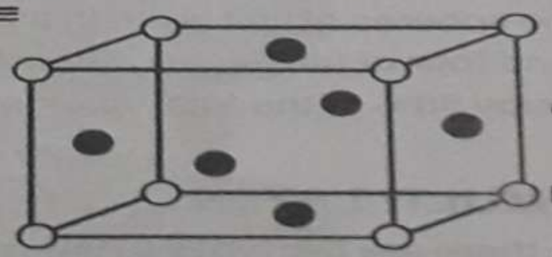


Cubical closest-packed structure

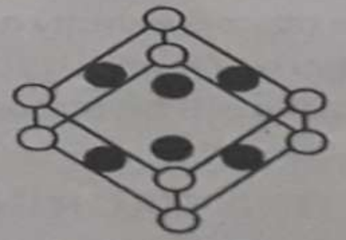




Planes of closes packing ≡

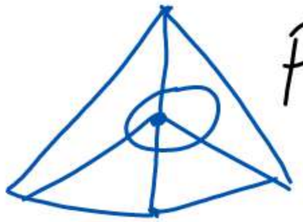


≡



ABCABCA.....or cubic closes packing (ccp) of spheres

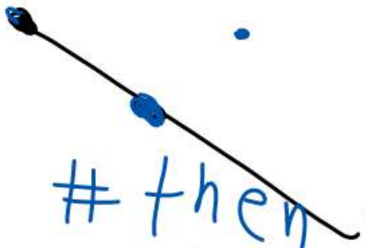
- # Tetrahedral Void



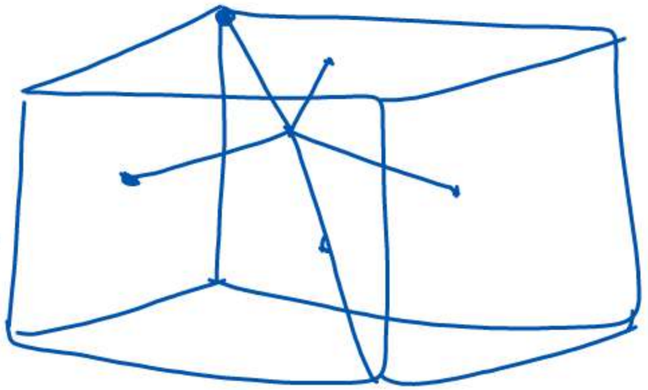
Position of T. H.V. & O. H.V.:

(1) In C.C.P./F.C.C.

T. H.V., In one body diagonal two Tetrahedral Void for

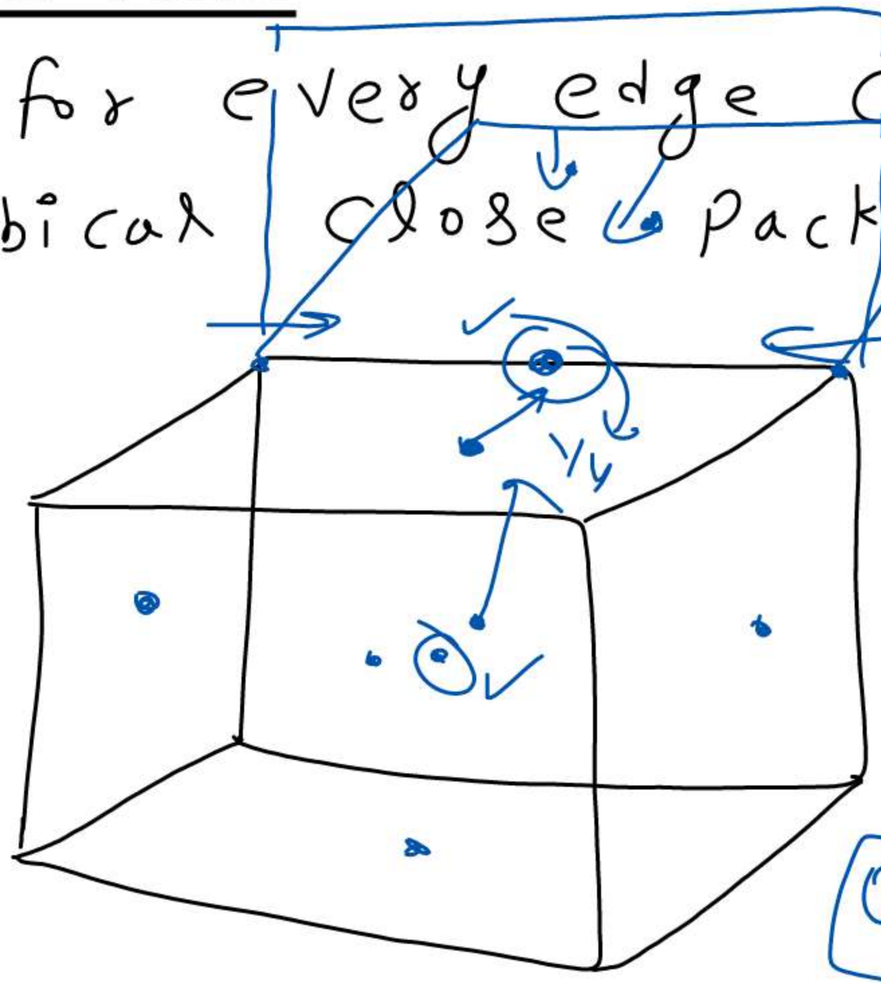


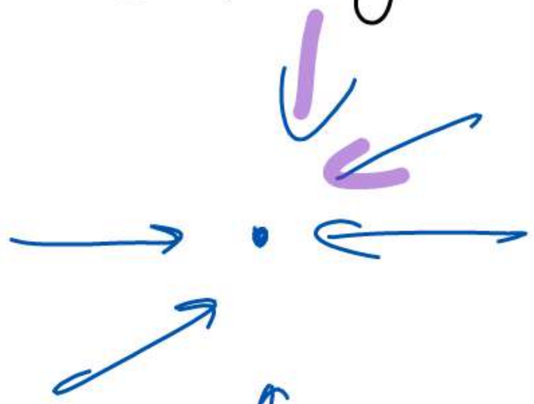
then in 1 C.C.P./F.C.C.
no. of T. H.V. = 2 x 4 = 8



- # Octahedral Void

O.H.V. for every edge Centre & Body centre of Cubical Close Packing





No of O.H.V in C.C.P.

$= 12 \times \frac{1}{4} + 1 \times 1$

$= 3 + 1$

O.H.V = 4

- Octahedral Void

F.C.C / C.C.P. $\Rightarrow Z = 4$

T.H.V. $= 8 = 2Z$

O.H.V. $= 4 = Z$