N. phy

A = mass No = Total No. of Nucleons

$$\boxed{A = N(\text{Neutrons}) + A\ (\text{mass No})}$$

$N = A - Z$. = Neutron No

Saturday 31

Isotopes: Z (Atomic No) → Same
A (mass NO) → Different

eg (1) ^{6}Li and ^{7}Li ⇒ The no. of protons in the nucleus of each is 3 but their neutrons numbers are 6 − 3 = 3 and 7 − 3 = 4 respectively.

(2) $^{1}H_1$, $^{2}H_1$, $^{3}H_1$

Isobars: Z → Diff., A → Same

Isotones: No. of neutrons (N) → Same
No matter what the Z value.

Mirror nuclei: The pairs of isobaric nuclei whose the Z and N are interchanged and differ by one unit are known as Mirror Nuclei.

eg: $\left(^{11}_{6}C \text{ and } ^{11}_{5}B\right)$, $\left(^{13}_{7}N \text{ and } ^{13}_{6}C\right)$

30 Friday 303th day

(Day 364-001) • Week 53

Nuclear Mass :-

$$M_{nuc} = M(A,Z) - Z m_e$$

Binding Energy :- (E_B) ⇒

$$E_B = \Delta m c^2$$

$$\Delta M = Z M_H + N M_n - M(A,Z)$$

M_H → Mass of Hydrogen; M_n → Mass of the neutron; $M(A,Z)$ → Mass of the Atom of mass no. A and at. No. Z

$$E_B = [Z M_H + N M_n - M(A,Z)] c^2$$

$$= [Z M_p + N M_n + Z m_e - M_{nuc} - Z m_e] c^2$$

$$\therefore E_B = [Z M_p + N M_n - M_{nuc}] c^2$$

ΔM (mass Loss)

$$\Delta M = Z M_p + N M_n - M_{nuc}$$