Calculate the energy released in MeV in the following nuclear reaction :

$_{1}^{2}H + _{1}^{2}H \rightarrow _{2}^{3}He + _{0}^{1}n$

Assume that the masses of $_{1}^{2}H$, $_{2}^{3}He$ and neutron (n) respectively are 2.020, 3.0160 and 1.0087 in amu.

A 14.25 MeV

B 1.425 MeV

C 142.5 MeV

D 1425 MeV

Correct option is A)

The mass defect is the difference between the mass of reactants and the mass of products.

$\Delta m = 2 \times m_{\,_{1}^{2}H} - m_{\,_{2}^{3}He} - m_n = (2 \times 2.020) - (3.0160 + 1.0087)$

$= 4.040 - 4.0247 = 0.0153$

The energy released during the nuclear reaction is

$\Delta E = \Delta m \times 931.48 MeV = 14.25 MeV$