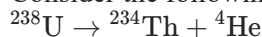


Q-Value of a Nuclear Reaction

1. Consider the following nuclear reaction :



Take masses of ^{238}U , ^{234}Th and ^4He as 238.050 u, 234.043 u and 4.003 u, respectively. The Q value for the reaction, in keV, is :

[Given : $1\text{u} = 931.5\text{MeVc}^{-2}$]

- (A) 3740 (B) 3726 (C) 3730 (D) 3736

NEET 2026

2. An unknown nucleus has a nuclear density of $2.29 \times 10^{17} \text{ kg/m}^3$ and mass of $19.926 \times 10^{-27} \text{ kg}$. Its mass number A is approximately : (Take $R_0 = 1.2 \times 10^{-15} \text{ m}$, $4\pi = 12.56$)

- (A) 16 (B) 20 (C) 12 (D) 19

NEET 2026

3. Four statements are given (A is mass number) :
- The volume of a nucleus is proportional to $A^{1/3}$.
 - The volume of a nucleus is proportional to A .
 - The difference in mass of an atom and its nucleus is called the mass defect.
 - The difference in mass of a nucleus and its constituents is called the mass defect.

Choose the correct answer from the options given below:

- (A) A and D are true, but B and C are false
 (B) B and D are true, but A and C are false
 (C) B and C are true, but A and D are false
 (D) A and C are true, but B and D are false

NEET 2026

4. $^{290}_{82}\text{X} \xrightarrow{\alpha} \text{Y} \xrightarrow{e^+} \text{Z} \xrightarrow{\beta^-} \text{P} \xrightarrow{e^-} \text{Q}$

In the nuclear emission stated above, the mass number and atomic number of the product Q respectively, are

- (A) 280, 81 (B) 286, 80 (C) 288, 82 (D) 286, 81

NEET 2024

5. A nucleus of mass number 189 splits into two nuclei having mass numbers 125 and 64. The ratio of radius of the two daughter nuclei respectively is

- (A) 4 : 5 (B) 5 : 4 (C) 25 : 16 (D) 1 : 1

NEET 2022

6. A radioactive nucleus ^A_ZX undergoes spontaneous decay in the sequence $^A_Z\text{X} \rightarrow ^A_{Z-1}\text{B} \rightarrow ^A_{Z-3}\text{C} \rightarrow ^A_{Z-2}\text{D}$, where Z is the atomic number of element X. The possible decay particles in the sequence are:

- (A) α, β^-, β^+ (B) α, β^+, β^-
 (C) β^+, α, β^- (D) β, α, β^+

NEET 2

7. A nucleus with mass number 240 breaks into two fragments each of mass number 120, the binding per nucleon of unfragmented nuclei is 7.6 MeV while that of fragment is 8.5 MeV. The total gain in the Binding Energy process is :

- (A) 216 MeV (B) 0.9 MeV (C) 9.4 MeV (D) 804 MeV

NEET 2

8. The energy equivalent of 0.5 g of a substance is :

- (A) $0.5 \times 10^{13} \text{ J}$ (B) $4.5 \times 10^{16} \text{ J}$
 (C) $4.5 \times 10^{13} \text{ J}$ (D) $1.5 \times 10^{13} \text{ J}$

NEET 2

9. If radius of the $^{13}_{13}\text{Al}^{27}$ Nucleus is taken to be R_{Al} , the radius of $^{125}_{53}\text{Te}$ nucleus is nearly.

- (A) $\left(\frac{53}{13}\right)^{1/3} R_{\text{Al}}$
 (B) $\frac{5}{3} R_{\text{Al}}$
 (C) $\frac{3}{5} R_{\text{Al}}$
 (D) $\left(\frac{13}{53}\right)^{1/3} R_{\text{Al}}$

NEET 2

10. The binding energy per nucleon of ^7_3Li and ^4_2He nuclei are 5.60 MeV and 7.06 MeV, respectively. In the nuclear reaction $^7_3\text{Li} + ^1_1\text{H} \rightarrow ^4_2\text{He} + \text{Q}$, the value of energy released is:

- (A) 19.6 MeV (B) -2.4 MeV (C) 8.4 MeV (D) 17.3 MeV

NEET 2

11. A certain mass of hydrogen is changed to Helium in a process of fusion. The mass defect in fusion reaction is 0.02866 u. The energy liberated per u is : (given 931MeV)

- (A) 13.35 MeV (B) 2.67 MeV (C) 26.7 MeV (D) 6.67 MeV

NEET 2

12. If the nuclear radius of $^{27}_{13}\text{Al}$ is 3.6 Fermi, the approximate nuclear radius of $^{64}_{29}\text{Cu}$ in Fermi is :

- (A) 4.8 (B) 3.6 (C) 2.4 (D) 1.2

NEET 2