CBSE NCERT Based Chapter wise Questions (2025-2026)
Class-XII
Subject: Physics
Chapter Name : *Atoms and Nuclei* (Chap : 8)

Total : 11 Marks (expected) [MCQ(2)-1 Mark, Assertion-Reason(1)-1 Mark, SA(1)-3 Marks, LA(1)-5 Marks]

Level - 2(Higher order)

MCQ Type Question:

1. How many neutrons are there in 14 g of $_6\text{C}^{14}$?

   Ⓐ 48×10^{23} Ⓑ 64×10^{23} Ⓒ 56×10^{23} Ⓓ 80×10^{23}

2. Two nuclei have their mass numbers in the ratio of their nuclear densities

   Ⓐ $1 : 27$ Ⓑ $1 : 1$ Ⓒ $1 : 9$ Ⓓ $1 : 3$

3. When an atom undergoes β decay, its atomic number :

   Ⓐ does not change   Ⓑ increases by 1   Ⓒ decreases by 1   Ⓓ decreases by 2

4. When an electron is emitted from a nucleus, then effect of its neutron proton ratio will

   Ⓐ remain same   Ⓑ increases   Ⓒ decreases   Ⓓ either Ⓐ or Ⓑ

5. Penetrating power is minimum for

   Ⓐ α rays   Ⓑ β rays   Ⓒ γ rays   Ⓓ X rays

Short Answer Type Questions (SAQ)

6. From the relation $R = R_0 A^{1/3}$ where R_0 is constant and A is the mass number of the nucleus, show that nuclear matter density is independent of A.

7. Define the mass defect. How is it related to stability of the nucleus.

8. Draw a diagram to show the variation of binding energy per nucleon with mass number for different nuclei. State the reason why light nuclei usually undergo nuclear fusion.

9. Complete the following reactions :

   (i) $\beta_5^{10} + n_0^1 \rightarrow \text{He}_2^4 + \cdots$

   (ii) $\text{Mo}_{42}^{94} + \text{H}_1^2 \rightarrow \text{Te}_{43}^{95} + \cdots$

10. What is nuclear fission? Give its equation.

Long Answer Type Questions (LAQ)

11. Classify the following six nuclides into (i) isotones (ii) isotopes and (iii) isobars :

    $\text{C}_6^{12}, \text{He}_2^3, \text{Hg}_{80}^{198}, \text{H}_1^3, \text{Au}_{79}^{197}, \text{C}_6^{14}$

12. If 200 MeV energy is released in the fission of a single nucleus of U_{92}^{235}, how many fissions must occurs to produce a power of 1 kW?

13. Calculate the energy released in fusion reaction : $\text{H}_2^2 + \text{H}_1^2 \rightarrow \text{He}_2^3 + n$ when binding energy of $\text{H}_1^2 = 2.23$ MeV and of $\text{He}_2^3 = 7.73$ MeV.

14. Calculate the disintegration energy Q for the fission of $^{98}_{42}\text{Mo}$ into two equal fragments of $^{49}_{21}\text{Sc}$.

Given that $\Rightarrow m\left(^{98}_{42}\text{Mo}\right) = 97.90541$ amu

$$m\left(^{49}_{21}\text{Sc}\right) = 48.95002 \text{ amu}$$

$$m_n = 1{,}00867 \text{ amu}$$

A N S W E R

1.	Ⓐ	6.		11.	
2.	Ⓑ	7.		12.	3.125×10^{13}
3.	Ⓑ	8.		13.	3.27 MeV
4.	Ⓒ	9.		14.	
5.	Ⓐ	10.			