



# PHYSICS

**BOOKS - BETTER CHOICE PUBLICATION**

## STRUCTURE OF NUCLEUS

### Very Short Answer Type Questions

1. Define isotones.



**Watch Video Solution**

2. What are Isotones ?



[Watch Video Solution](#)

3. What do you mean by mass defect of a nucleus?



[Watch Video Solution](#)

4. What are isobars ?



[Watch Video Solution](#)

5. What are Isotopes ?



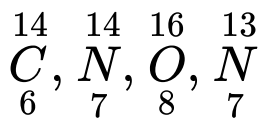
[Watch Video Solution](#)

6. Define isotopes.



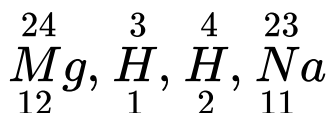
[Watch Video Solution](#)

7. Select the pair of isobars and isotones from the following:



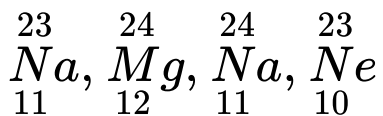
Watch Video Solution

8. Select the pair of isobars and isotones from the following:



Watch Video Solution

9. Select the pair of isobars and isotones from the following:



Watch Video Solution

10. One atomic mass unit is equal to  $1.67 \times 10^{-27} g$ .



Watch Video Solution

Short Answer Type Questions

1. What is meant by size of nucleus? do all nuclei are of same size?



**Watch Video Solution**

2. What are the constituents of the nucleus?

Give four properties of neutrons.



**Watch Video Solution**

3. In heavy nuclei, the number of neutrons is higher than the number of protons. Why ?



[Watch Video Solution](#)

4. Why is the mass of nucleus less than sum of masses of nucleons present in it ?



[Watch Video Solution](#)

5. What do you mean by binding energy ?

Explain the significance of binding energy per nucleon in the stability of nucleus.



[Watch Video Solution](#)

6. For greater stability, a nucleus should have greater value of binding energy per nucleon. Why?



[Watch Video Solution](#)



7. Natural radioactive nuclei are nuclei of high mass number. Why?



**Watch Video Solution**

8. Heavy stable nuclei have more neutrons than protons. This is because of the fact that



**Watch Video Solution**

**9.** All protons in an atom remain packed in a small nucleus inspite of the electrostatic repulsive force among them.Why?



**Watch Video Solution**

**10.** Write four characteristics of any natural force.



**Watch Video Solution**

**11.** Differentiate between Isobars and Isotones with suitable examples.



**Watch Video Solution**

**12.** Differentiate between Isotopes and Isobars with suitable examples.



**Watch Video Solution**

**13.** Differentiate between Isotones and Isotopes with suitable examples.



**Watch Video Solution**

**14.** What is Einstein's mass energy relation?



**Watch Video Solution**

**Short Answer Type Question**

1. What do you mean by binding energy ?

Explain the significance of binding energy per nucleon in the stability of nucleus.



[Watch Video Solution](#)

2. Define Binding energy of the nucleus. Draw and explain curve between Binding Energy per nucleon and mass number.



[Watch Video Solution](#)

3. Define binding energy, binding energy per nucleon. Draw and explain a curve between binding energy per nucleon and mass number.



[Watch Video Solution](#)

4. Draw the graph showing variation of binding energy per nucleon with mass number. Write the inferences drawn from the graph.



[Watch Video Solution](#)

5. What are nuclear forces ? State their four properties.



[Watch Video Solution](#)

## Long Answer Type Questions

1. What are nuclear forces ? State their four properties. Explain the possible cause of these forces.



[Watch Video Solution](#)

## Numerical Problems

1. Find binding energy per nucleon for helium nuclei. Given that mass of helium nucleus = 4.001509 amu, mass of proton = 1.007277 amu and mass of neutron = 1.008666 amu.



[Watch Video Solution](#)

2. Calculate mass defect, binding energy and binding energy per nucleon of deuteron ( ${}_1H^2$ )



nucleus. Given mass of proton = 1.007275 a.m.u., mass of neutron = 1.008665 a.m.u. and mass of deuteron = 2.013553 a.m.u.



[Watch Video Solution](#)

3. Find out binding energy and binding energy per nucleon of  ${}^7_3\text{Li}$  nucleus. Given mass of proton = 1.00782 amu mass of a neutron = 1.00866 amu and mass of  ${}^7_3\text{Li}$  (Lithium) nucleus = 7.01599 amu.



[Watch Video Solution](#)

4. Calculate the binding energy per nucleon of  ${}_3\text{Li}^7$  nucleus. Given mass of  ${}_3\text{Li}^7$  nucleus = 7.01599 a.m.u., mass of proton = 1.007825 a.m.u., mass of neutron = 1.008665 a.m.u. and 1 a.m.u. = 931.5 MeV



[Watch Video Solution](#)

5. Calculate the binding energy per nucleon of nucleus.  ${}_6\text{C}^{12}$  Given mass of  ${}_6\text{C}^{12}$  nucleus = 12.000000 a.m.u., mass of proton =

1.007825 a.m.u., mass of neutron = 1.008665 a.m.u. and 1 a.m.u. = 931.5 MeV



[Watch Video Solution](#)

6. Calculate the binding energy per nucleon of  ${}_{20}\text{Ca}^{40}$  nucleus. Given mass of  ${}_{20}\text{Ca}^{40}$  nucleus = 39.962589 a.m.u., mass of proton = 1.007825 a.m.u., mass of neutron = 1.008665 a.m.u. and 1 a.m.u. = 931.5 MeV.



[Watch Video Solution](#)

## Most Expected Questions

1. Is free neutron a stable particle?



[Watch Video Solution](#)

2. What is Einstein's mass energy relation?



[Watch Video Solution](#)

3. Express unified atomic mass unit in kg.





[Watch Video Solution](#)

4. State and explain binding energy of a nucleus.



[Watch Video Solution](#)