

Topic :-Nuclei

- In a hydrogen atom, the distance between the electron and proton is $2.5 \times 10^{-11}m$. The electrical force of attraction between them will be
a) $2.8 \times 10^{-7}N$ b) $3.7 \times 10^{-7}N$ c) $6.2 \times 10^{-7}N$ d) $9.1 \times 10^{-7}N$
- Sun energy is due to
a) Fission of hydrogen b) Fusion of hydrogen
c) Both fission and fusion d) Neither fusion nor fission
- The α -particle is the nucleus of an atom of
a) Neon b) Hydrogen c) Helium d) Deuterium
- The binding energy of an electron in the ground state of He is equal to 24.6 eV. The energy required to remove both the electrons is
a) 49.2 eV b) 24.6 eV c) 38.2 eV d) 79.0 eV
- The mass of an α -particle is
a) Less than the sum of masses of two protons and two neutrons
b) Equal to mass of four protons
c) Equal to mass of four neutrons
d) Equal to sum of masses of two protons and two neutrons
- In artificial radioactivity, 1.414×10^6 nuclei are disintegrated into 10^6 nuclei in 10 min. The half-life in minutes must be
a) 5 b) 20 c) 15 d) 30
- The energy in MeV is released due to transformation of 1 kg mass completely into energy ($c = 3 \times 10^8 m/s$)
a) $7.625 \times 10 MeV$ b) $10.5 \times 10^{29} MeV$ c) $2.8 \times 10^{-28} MeV$ d) $5.625 \times 10^{29} MeV$
- A radioactive substance emits
a) α -rays b) β -rays c) γ -rays d) All of these
- In the nuclear reaction ${}_{85}X^{297} \rightarrow Y + 4\alpha$, Y is
a) ${}_{76}Y^{287}$ b) ${}_{77}Y^{285}$ c) ${}_{77}Y^{281}$ d) ${}_{77}Y^{289}$
- The ratio of minimum wavelengths of Lyman and Balmer series will be
a) 5 b) 10 c) 1.25 d) 0.25
- The atoms of same element having different masses but same chemical properties, are called
a) Isotones b) Isotopes c) Isobars d) Isomers
- After 280 days, the activity of a radioactive sample is 6000 dps. The activity reduces to 3000dps after another 140 days. The initial activity of the sample(in dps) is
a) 6000 b) 9000 c) 3000 d) 24000

13. Hydrogen bomb is based upon
 a) Fission b) fusion c) Chemical reaction d) Transmutation
14. What is the ground state energy of positronium
 a) 13.6 eV b) 27.2 eV c) 5.4 eV d) 1.8 eV
15. Nuclear reactions are given as
 (i) $\square (n,p)_{15}P^{32}$ (ii) $\square (p,\alpha)_8O^{16}$ (iii) ${}_7N^{14}$ (iv) ${}_6C^{14}$
 Missing particle or nuclide (in box \square) in these reactions are respectively
 a) $S^{32}, F^{19}, {}_0n^1$ b) $F^{19}, S^{32}, {}_0n^1$ c) $Be^9, F^{19}, {}_0n^1$ d) None of these
16. In a sample of radioactive material, what percentage of the initial number of active nuclei will decay during one mean life
 a) 69.3% b) 63% c) 50% d) 37%
17. If half life of a radioactive element is 3 hours, after 9 hours its activity becomes
 a) 1/9 b) 1/27 c) 1/6 d) 1/8
18. The S.I. unit of radioactivity is
 a) Roentgen b) Rutherford c) Curie d) Becquerel
19. A nucleus ${}_nX^m$ emits one α and one β -particle. The resulting nucleus is
 a) ${}_nX^{m-4}$ b) ${}_{n-2}X^{m-4}$ c) ${}_{n-4}Z^{m-4}$ d) ${}_{n-1}Z^{m-4}$
20. Which of the relation is correct correct between time period and number of orbits while an electron is revolving in an orbit
 a) n^2 b) $\frac{1}{n^2}$ c) n^3 d) $\frac{1}{n}$