

Q.1) Which of the following represents an alpha particle?

a) proton

b) neutron

c) Electron

d) dispositive helium ion

Q.2) Which of the following represents a beta particle?

a) proton

b) neutron

c) Electron

d) dispositive helium ion

Q.3) Which of the following represents gamma rays?

a) stream of dispositive helium ions

b) electromagnetic radiation

c) stream of electrons

d) cathode rays

Q.4) Which of the following is not deflected in an electrical field?

a) alpha particles

b) beta particles

c) Gamma rays

d) protons

Q.5) Group 15 element $^{211}_{83}\text{Bi}$ is transformed to $^{211}_{84}\text{Po}$. To which group does the element Po belong?

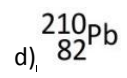
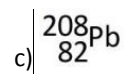
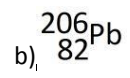
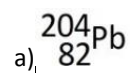
a) 14

b) 15

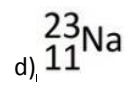
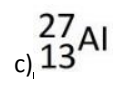
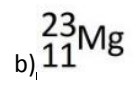
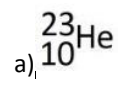
c) 16

d) 13

Q.6) The element $^{210}_{84}\text{Po}$ emits an alpha particle. The daughter element is



Q.7) The element of $^{23}_{10}\text{Mg}$ emits a beta particle. The daughter element is



Q.8) In a radioactive decay ${}_{90}^{232}\text{Th}$ is transformed into ${}_{82}^{208}\text{Pb}$. The number of alpha & beta particles emitted respectively are

a) 4, 6

b) 4, 4

c) 6, 6

d) 6, 4

Q.9) The half-life of a radioactive decay is given as

a) $t_{1/2} = 0.693 / \lambda$

b) $t_{1/2} = \log 2 / \lambda$

c) $t_{1/2} = \lambda / \log 2$

d) $t_{1/2} = \lambda / 0.693$

Q.10) The disintegration rate of a radioactive element changes from an initial value of 10000 disintegrations per minute to 2500 disintegrations per minute in 50 days. The half-life of the element is

a) 25 days

b) 50 days

c) 75 days

d) 100 days

Q.11) If N_0 and N are the number of radioactive particles at $t=0$ and at time t , then

a)
$$\lambda = \frac{1}{2} \log \frac{N_0}{N}$$

b)
$$\lambda = \frac{2.303}{t} \log \frac{N}{N_0}$$

c)
$$\lambda = \frac{t}{2.303} \log \frac{N_0}{N}$$

d)
$$\lambda = \frac{1}{t} \ln \frac{N_0}{N}$$

Where λ is the decay constant.

Q.12) The activity of a sample has 40% as much radioactivity as present originally. If half life period of the radioactivity is 5000y, the life of the sample undergoing disintegration is

a) 5000 y

b) 6000 y

c) 6667 y

d) 5667 y

Q.13) The energy equivalent to 1 atomic mass is

a) 921 MeV

b) 931 MeV

c) 941 MeV

d) 951 MeV

Q.14)The expression of mass-energy conversion is

a) $E=m^2c$

b) $E=mc^2$

c) $E^2=mc$

d) $E^2=mc^2$

Q.15) Me V stands for

- a) milli electron volt
- b) milli electron velocity
- c) mill electron volume
- d) mega electron volt

Q.16) Binding energy can be calculated from the formula

a) Binding energy = (mass defect) $\left(\frac{931 \text{ MeV}}{1 \text{ amu}} \right)$

b) Binding energy = (mass defect) $\left(\frac{9.31 \text{ MeV}}{1 \text{ amu}} \right)$

c) Binding energy = $\frac{(\text{Mass defect} / 1 \text{ amu})}{931.05} \text{ MeV}$

d) Binding energy = $\frac{(\text{Mass defect} / 1 \text{ amu})}{9.31} \text{ MeV}$

Q.17) The mass defect for the formation of ^{12}C is 0.10242amu. Its binding energy would be

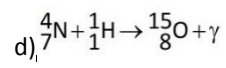
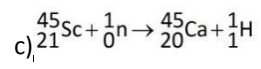
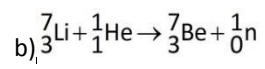
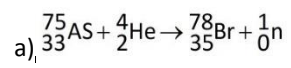
a) 95.35 MeV

b) 9.535 MeV

c) 95.35 eV

d) 9.535 eV

Q.18) Which one of the following is an (α, n) type nuclear transformation ?



Q.19) For which radioactive series, lead is not the end product?

a) $4n$

b) $4n+1$

c) $4n+2$

d) $4n+3$

Q.20) Atom bombs are based on

a) natural radioactivity

b) nuclear fission

c) nuclear fusion

d) spontaneous chemical reaction

Q.21)Hydrogen bomb is based on

a)natural radioactivity

b)nuclear fission

c)nuclear fusion

d)spontaneous chemical reaction

Q.22)The material used for absorbing neutrons in a nuclear reactor is

a)cadmium

b)radium

c)uranium

d)zinc

Q.23) The half-life of a radioactive isotope is three hours. If the initial mass of the isotope were 256g, the mass of it remaining undecayed after 18 hours would be

a) 16.0g

b) 4.0g

c) 8.0g

d) 12.0g

Q.24) Consider the following nuclear reactions: ${}_{92}^{238}\text{M} \rightarrow {}_Y^X\text{N} + 2{}_2^4\text{He}; {}_Y^X\text{N} \rightarrow {}_B^A\text{L} + 2\beta^+$

The number of neutrons in the element L is

- a) 142
- b) 144
- c) 140
- d) 146

Q.25) The half-life of a radioisotope is four hours. If the initial mass of the isotope was 200g, the mass remaining after 24 hours undecayed is

a) 1.042g

b) 2.084g

c) 3.125g

d) 4.167g

Q.26)Hydrogen bomb is based on the principle of

- a)nuclear fusion
- b)artificial radioactivity
- c)natural radioactivity
- d)nuclear fission

Q.27) A photon of hard gamma radiation knocks a proton out of $^{24}_{12}\text{Mg}$ to form

a) the nuclide $^{23}_{11}\text{Na}$

b) the isobar of $^{23}_{11}\text{Na}$

c) the isotope of parent nucleus

d) the isobar of parent nucleus

Q.28) In the transformation of ${}_{92}^{238}\text{U}$ to ${}_{92}^{234}\text{U}$, if one emission is an α -particle, what should be the other emission(s)?

a) One β^+ and one β^-

b) Two β^-

c) Two β^- and one β^+

d) One β^- and one γ

Q.29) A radioactive element gets spilled over the floor of a room. Its half-life period is 30 days. If the initial activity is ten times the permissible value, after how many days will it be safe to enter the room ?

a) 1000 days

b) 300 days

c) 10 days

d) 100 days

Q.30) Which of the following nuclear reactions will generate an isotope?

a) neutron particle emission

b) positron emission

c) α -particle emission

d) β -particle emission

