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NEET NUCLEI — PYQS

Max. Marks: 304 **Questions:** 76

Section A (MCQ) — 76 questions

Q.1 Four statements are given (A is mass number) :

A. The volume of a nucleus is proportional to $A^{1/3}$.

B. The volume of a nucleus is proportional to A.

C. The difference in mass of an atom and its nucleus is called the mass defect.

D. The difference in mass of a nucleus and its constituents is called the mass defect.

Choose the correct answer from the options given below : [NEET (UG) 2026]

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

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

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

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

Scan or tap for the full solution

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

[NEET (UG) 2026]

(1) 16 (2) 20 (3) 12 (4) 19

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Q.3 Consider the following nuclear reaction

$^{238}U \longrightarrow {}^{234}Th + {}^{4}He$

Take masses of ^{238}U, ^{234}Th and ^{4}He as 238.050 u, 234.043 u and 4.003 u, respectively. The Q value for the reaction, in keV, is:
[Given: 1 u = 931.5 MeV c^{-2}] [RE-NEET (UG) 2026]

(1) 3740 (2) 3726 (3) 3730 (4) 3736

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

In the nuclear emission stated above, the mass number and atomic number of the product Q respectively, are [NEET (UG) 2024]

(1) 280, 81 (2) 286, 80 (3) 288, 82 (4) 286, 81

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Q.5 Water is used as a coolant in a nuclear reactor because of its [RE-NEET (UG) 2024]

(1) high thermal expansion coefficient

(2) high specific heat capacity

(3) low density

(4) low boiling point

Solution

Q.6 Select the correct statements among the following :
Choose the most appropriate answer from the options given below :

A. Slow neutrons can cause fission in $^{235}_{92}U$ more readily than fast neutrons.

B. α-rays are Helium nuclei.

C. β-rays are fast moving electrons or positrons.

D. γ-rays are electromagnetic radiations of wavelengths larger than X-rays.

[RE-NEET (UG) 2024]

(1) A, B and C only (2) A, B and D only

(3) A and B only (4) C and D only

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Q.7 The half life of a radioactive substance is 20 minutes. In how much time, the activity of substance drops to $\left(\frac{1}{16}\right)^{th}$ of its initial value?

[NEET (UG) 2023]

(1) 40 minutes (2) 60 minutes

(3) 80 minutes (4) 20 minutes

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Q.8 A nucleus of mass number 189 splits into two nuclei having mass number 125 and 64. The ratio of radius of two daughter nuclei respectively is

[NEET (UG) 2022]

(1) 1:1 (2) 4:5 (3) 5:4 (4) 25:16

Scan or tap for the full solution

Q.9 In the given nuclear reaction, the element X is

$^{22}_{11}Na \longrightarrow X + e^+ + \nu$ [NEET (UG) 2022]

(1) $^{23}_{11}Na$ (2) $^{23}_{10}Ne$ (3) $^{22}_{10}Ne$ (4) $^{22}_{12}Mg$

Scan or tap for the full solution

Q.10 Given below are two statements

Statement-I: The law of radioactive decay states that the number of nuclei undergoing the decay per unit time is inversely proportional to the total number of nuclei in the sample.

Statement-II: The half-life of a radionuclide is the sum of the life time of all nuclei, divided by the initial concentration of the nuclei at time t = 0.

In the light of the above statements, choose the most appropriate answer from the options given below : [NEET (UG) 2022 (Phase 2)]

(1) Statement-I is incorrect but statement II is correct

(2) Both statement I and statement II are correct

(3) Both statement I and statement II are incorrect

(4) Statement-I is correct but statement II is incorrect

Scan or tap for the full solution

Q.11 At any instant, two elements X_1 and X_2 have same number of radioactive atoms. If the decay constant of X_1 and X_2 are 10λ and λ respectively, then the time when the ratio of their atoms becomes $\frac{1}{e}$ respectively will be : [NEET (UG) 2022 (Phase 2)]

(1) $\frac{1}{5\lambda}$ (2) $\frac{1}{11\lambda}$ (3) $\frac{1}{9\lambda}$ (4) $\frac{1}{6\lambda}$

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Q.12 A nucleus with mass number 240 breaks into two fragments each of mass number 120, the binding energy per nucleon of unfragmented nuclei is 7.6 MeV while that of fragments is 8.5 MeV. The total gain in the Binding Energy in the process is : [NEET (UG) 2021]

(1) 216 MeV (2) 0.9 MeV

(3) 9.4 MeV (4) 804 MeV

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Q.13 The half life of a radioactive nuclide is 100 hours. The fraction of original activity that will remain after 150 hours would be : [NEET (UG) 2021]

(1) $\frac{2}{3\sqrt{2}}$ (2) $\frac{1}{2}$ (3) $\frac{1}{2\sqrt{2}}$ (4) $\frac{2}{3}$

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Q.14 A radioactive nucleus

$^{A}_{Z}X \longrightarrow {}_{Z-1}B \longrightarrow {}_{Z-3}C \longrightarrow {}_{Z-2}D$,

where Z is the atomic number of element X. The possible decay particles in the sequence are : [NEET (UG) 2021]

(1) β^-, α, β^+ (2) α, β^-, β^+

(3) α, β^+, β^- (4) β^+, α, β^-

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Q.15 The energy equivalent of 0.5 g of a substance is : [NEET (UG) 2020]

(1) 4.5×10^{13} J (2) 1.5×10^{13} J

(3) 0.5×10^{13} J (4) 4.5×10^{16} J

Scan or tap for the full solution

Q.16 When a uranium isotope $^{235}_{92}U$ is bombarded with a neutron, it generates $^{89}_{36}Kr$, three neutrons and : [NEET (UG) 2020]

(1) $^{91}_{40}Zr$ (2) $^{101}_{36}Kr$ (3) $^{103}_{36}Kr$ (4) $^{144}_{56}Ba$

Scan or tap for the full solution

Q.17 For a radioactive material, half-life is 10 minutes. If initially there are 600 number of nuclei, the time taken (in minutes) for the disintegration of 450 nuclei is [NEET 2018]

(1) 20 (2) 10 (3) 30 (4) 15

Scan or tap for the full solution

Q.18 Radioactive material 'A' has decay constant '8λ' and material 'B' has decay constant 'λ'. Initially they have same number of nuclei. After what time, the ratio of number of nuclei of material 'B' to that of 'A' will be e ? [NEET 2017]

(1) $\frac{1}{7\lambda}$ (2) $\frac{1}{8\lambda}$ (3) $\frac{1}{9\lambda}$ (4) $\frac{1}{\lambda}$

Scan or tap for the full solution

Q.19 The half-life of a radioactive substance is 30 minutes. The time (in minutes) taken between 40% decay and 85% decay of the same radioactive substance is [NEET 2016 (Phase 2)]

(1) 15 (2) 30 (3) 45 (4) 60

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Q.20 A nucleus of uranium decays at rest into nuclei of thorium and helium. Then [AIPMT 2015]

(1) The helium nucleus has more momentum than the thorium nucleus.

(2) The helium nucleus has less kinetic energy than the thorium nucleus.

(3) The helium nucleus has more kinetic energy than the thorium nucleus.

(4) The helium nucleus has less momentum than the thorium nucleus.

Scan or tap for the full solution

Q.21 If radius of the $^{27}_{13}Al$ nucleus is taken to be R_{Al}, then the radius of $^{125}_{53}Te$ nucleus is nearly [AIPMT 2015 (Cancelled)]

(1) $\frac{3}{5}R_{Al}$ (2) $\left(\frac{13}{53}\right)^{1/3} R_{Al}$

(3) $\left(\frac{53}{13}\right)^{1/3} R_{Al}$ (4) $\frac{5}{3}R_{Al}$

Scan or tap for the full solution

Q.22 The binding energy per nucleon of $^{7}_{3}Li$ and $^{4}_{2}He$ nuclei are 5.60 MeV and 7.06 MeV respectively. In the nuclear reaction

$^{7}_{3}Li + ^{1}_{1}H \longrightarrow ^{4}_{2}He + ^{4}_{2}He + Q$

the value of energy Q released is [AIPMT 2014]

(1) 19.6 MeV (2) −2.4 MeV

(3) 8.4 MeV (4) 17.3 MeV

Scan or tap for the full solution

Q.23 A radioactive X with a half life 1.4×10^9 years decays to Y which is stable. A sample of the rock from a cave was found to contain X and Y in the ratio 1:7. The age of the rock is [AIPMT 2014]

(1) 1.96×10^9 years (2) 3.92×10^9 years

(3) 4.20×10^9 years (4) 8.40×10^9 years

Scan or tap for the full solution

Q.24 A certain mass of Hydrogen is changed to Helium by the process of fusion. The mass defect in fusion reaction is 0.02866 u. The energy liberated per u is (given 1 u = 931 MeV) [NEET 2013]

(1) 6.675 MeV (2) 13.35 MeV

(3) 2.67 MeV (4) 26.7 MeV

Scan or tap for the full solution

Q.25 The half life of a radioactive isotope 'X' is 20 years. It decays to another element 'Y' which is stable. The two elements 'X' and 'Y' were found to be in the ratio 1 : 7 in a sample of a given rock. The age of the rock is estimated to be [NEET 2013]

(1) 80 years (2) 100 years

(3) 40 years (4) 60 years

Scan or tap for the full solution

Q.26 How does the Binding Energy per nucleon vary with the increase in the number of nucleons ? [NEET 2013 (Karnataka)]

(1) Decreases continuously with mass number.

(2) First decreases and then increases with increase in mass number.

(3) First increases and then decreases with increase in mass number.

(4) Increases continuously with mass number.

Scan or tap for the full solution

Q.27 α-particles, β-particles and γ-rays are all having same energy. Their penetrating power in a given medium in increasing order will be [NEET 2013 (Karnataka)]

(1) γ, α, β (2) α, β, γ (3) β, α, γ (4) β, γ, α

Scan or tap for the full solution

Q.28 The half life of a radioactive nucleus is 50 days. The time interval $(t_2 - t_1)$ between the time t_2 when $\frac{2}{3}$ of it has decayed and the time t_1 when $\frac{1}{3}$ of it had decayed is [AIPMT 2012 (Mains)]

(1) 30 days (2) 50 days

(3) 60 days (4) 15 days

Scan or tap for the full solution

Q.29 If the nuclear radius of ^{27}Al is 3.6 fermi, the approximate nuclear radius of ^{64}Cu in fermi is [AIPMT 2012 (Prelims)]

(1) 2.4 (2) 1.2 (3) 4.8 (4) 3.6

Scan or tap for the full solution

Q.30 A mixture consists of two radioactive materials A_1 and A_2 with half lives of 20 s and 10 s respectively. Initially the mixture has 40 g of A_1 and 160 g of A_2. The amount of the two in the mixture will become equal after [AIPMT 2012 (Prelims)]

(1) 60 s (2) 80 s (3) 20 s (4) 40 s

Scan or tap for the full solution

Q.31 Two radioactive nuclei P and Q, in a given sample decay into a stable nucleus R. At time t = 0, the number of P species is $4N_0$ and that of Q is N_0. Half-life of P (for conversion to R) is 1 minute whereas that of Q is 2 minutes. Initially there are no nuclei of R present in the sample. When number of nuclei of P and Q are equal, the number of nuclei of R present in the sample would be [AIPMT 2011 (Mains)]

(1) $2N_0$ (2) $3N_0$ (3) $\frac{9N_0}{2}$ (4) $\frac{5N_0}{2}$

Scan or tap for the full solution

Q.32 The power obtained in a reactor using ^{235}U disintegration is 1000 kW. The mass decay of ^{235}U per hour is [AIPMT 2011 (Prelims)]

(1) 10 microgram (2) 20 microgram
(3) 40 microgram (4) 1 microgram

Scan or tap for the full solution

Q.33 Fusion reaction takes place at high temperature because [AIPMT 2011 (Prelims)]
(1) nuclei break up at high temperature
(2) atoms get ionised at high temperature
(3) kinetic energy is high enough to overcome the Coulomb repulsion between nuclei
(4) molecules break up at high temperature

Scan or tap for the full solution

Q.34 The half life of a radioactive isotope X is 50 years. It decays to another element Y which is stable. The two elements X and Y were found to be in the ratio of 1 : 15 in a sample of a given rock. The age of the rock was estimated to be [AIPMT 2011 (Prelims)]
(1) 150 years (2) 200 years
(3) 250 years (4) 100 years

Scan or tap for the full solution

Q.35 A nucleus ${}^{m}{}_{n}X$ emits one α particle and two β particles. The resulting nucleus is [AIPMT 2011 (Prelims)]
(1) ${}^{m-6}{}_{n-4}Z$ (2) ${}^{m-6}{}_{n}Z$ (3) ${}^{m-4}{}_{n}X$ (4) ${}^{m-4}{}_{n-2}Y$

Scan or tap for the full solution

Q.36 The binding energy per nucleon in deuterium and helium nuclei are 1.1 MeV and 7.0 MeV, respectively. When two deuterium nuclei fuse to form a helium nucleus the energy released in the fusion is [AIPMT 2010 (Mains)]
(1) 23.6 MeV (2) 2.2 MeV
(3) 28.0 MeV (4) 30.2 MeV

Scan or tap for the full solution

Q.37 The decay constant of a radioisotope is λ. If A_1 and A_2 are its activities at times t_1 and t_2 respectively, the number of nuclei which have decayed during the time $(t_1 - t_2)$ [AIPMT 2010 (Mains)]
(1) $A_1t_1 - A_2t_2$ (2) $A_1 - A_2$
(3) $(A_1 - A_2)/\lambda$ (4) $\lambda(A_1 - A_2)$

Scan or tap for the full solution

Q.38 The mass of a ${}^{7}{}_{3}Li$ nucleus is 0.042 u less than the sum of the masses of all its nucleons. The binding energy per nucleon of ${}^{7}{}_{3}Li$ nucleus is nearly [AIPMT 2010 (Prelims)]
(1) 46 MeV (2) 5.6 MeV
(3) 3.9 MeV (4) 23 MeV

Scan or tap for the full solution

Q.39 The activity of a radioactive sample is measured as N_0 counts per minute at t = 0 and N_0/e counts per minute at t = 5 minutes. The time (in minutes) at which the activity reduces to half its value is [AIPMT 2010 (Prelims)]
(1) $\log_e \frac{2}{5}$ (2) $\frac{5}{\log_e 2}$
(3) $5\log_{10} 2$ (4) $5\log_e 2$

Scan or tap for the full solution

Q.40 In the nuclear decay given below
$${}^{A}{}_{Z}X \longrightarrow {}^{A}{}_{Z+1}Y \longrightarrow {}^{A-4}{}_{Z-1}B^{*} \longrightarrow {}^{A-4}{}_{Z-1}B,$$
the particles emitted in the sequence are [AIPMT 2009]
(1) γ, β, α (2) β, γ, α (3) α, β, γ (4) β, α, γ

Scan or tap for the full solution

Q.41 The number of beta particles emitted by a radioactive substance is twice the number of alpha particles emitted by it. The resulting daughter is an [AIPMT 2009]
(1) isomer of parent (2) isotone of parent
(3) isotope of parent (4) isobar of parent

Scan or tap for the full solution

Q.42 If M(A, Z), M_p and M_n denote the masses of the nucleus ${}^{A}{}_{Z}X$, proton and neutron respectively in units of u (1 u = 931.5 MeV/c^2) and BE represents its binding energy in MeV, then [AIPMT 2008]
(1) $M(A, Z) = ZM_p + (A - Z)M_n - BE$
(2) $M(A, Z) = ZM_p + (A - Z)M_n + BE/c^2$
(3) $M(A, Z) = ZM_p + (A - Z)M_n - BE/c^2$
(4) $M(A, Z) = ZM_p + (A - Z)M_n + BE$

Scan or tap for the full solution

Q.43 Two nuclei have their mass numbers in the ratio of 1 : 3. The ratio of their nuclear densities would be [AIPMT 2008]
(1) $(3)^{1/3}:1$ (2) 1 : 1 (3) 1 : 3 (4) 3 : 1

Scan or tap for the full solution

Q.44 Two radioactive materials X_1 and X_2 have decay constants 5λ and λ respectively. If initially they have the same number of nuclei, then the ratio of the number of nuclei of X_1 to that of X_2 will be $\frac{1}{e}$ after a time [AIPMT 2008]

(1) $\frac{1}{4\lambda}$ (2) $\frac{e}{\lambda}$ (3) λ (4) $\frac{1}{2\lambda}$

Scan or tap for the full solution

Q.45 A nucleus $^{A}_{Z}X$ has mass represented by M(A, Z). If M_p and M_n denote the mass of proton and neutron respectively and B.E. the binding energy in MeV, then [AIPMT 2007]

(1) B.E. = $[ZM_p + (A - Z)M_n - M(A, Z)]c^2$

(2) B.E. = $[ZM_p + AM_p - M(A, Z)]c^2$

(3) B.E. = $M(A, Z) - ZM_p - (A - Z)M_n$

(4) B.E. = $[M(A, Z) - ZM_p - (A - Z)M_n]c^2$

Scan or tap for the full solution

Q.46 Two radioactive substances A and B have decay constants 5λ and λ respectively. At t = 0 they have the same number of nuclei. The ratio of number of nuclei of A to those of B will be $\left(\frac{1}{e}\right)^2$ after a time interval [AIPMT 2007]

(1) 4λ (2) 2λ (3) $\frac{1}{2\lambda}$ (4) $\frac{1}{4\lambda}$

Scan or tap for the full solution

Q.47 In a radioactive decay process, the negatively charged emitted β-particles are [AIPMT 2007]

(1) the electrons produced as a result of the decay of neutrons inside the nucleus

(2) the electrons produced as a result of collisions between atoms

(3) the electrons orbiting around the nucleus

(4) the electrons present inside the nucleus

Scan or tap for the full solution

Q.48 If the nucleus $^{27}_{13}Al$ has a nuclear radius of about 3.6 fm, then $^{125}_{52}Te$ would have its radius approximately as [AIPMT 2007]

(1) 9.6 fm (2) 12.0 fm

(3) 4.8 fm (4) 6.0 fm

Scan or tap for the full solution

Q.49 The binding energy of deuteron is 2.2 MeV and that of $^{4}_{2}He$ is 28 MeV. If two deuterons are fused to form one $^{4}_{2}He$ then the energy released is [AIPMT 2006]

(1) 30.2 MeV (2) 25.8 MeV

(3) 23.6 MeV (4) 19.2 MeV

Scan or tap for the full solution

Q.50 In a radioactive material the activity at time t_1 is R_1 and at a later time t_2, it is R_2. If the decay constant of the material is λ, then [AIPMT 2006]

(1) $R_1 = R_2$ (2) $R_1 = R_2 e^{-\lambda(t_1 - t_2)}$

(3) $R_1 = R_2 e^{\lambda(t_1 - t_2)}$ (4) $R_1 = R_2(t_2/t_1)$.

Scan or tap for the full solution

Q.51 The radius of germanium (Ge) nuclide is measured to be twice the radius of $^{9}_{4}Be$. The number of nucleons in Ge are [AIPMT 2006]

(1) 72 (2) 73 (3) 74 (4) 75

Scan or tap for the full solution

Q.52 In the reaction $^{2}_{1}H + ^{3}_{1}H \longrightarrow ^{4}_{2}He + ^{1}_{0}n$, if the binding energies of $^{2}_{1}H$, $^{3}_{1}H$ and $^{4}_{2}He$ are respectively a, b and c (in MeV), then the energy (in MeV) released in this reaction is [AIPMT 2005]

(1) a + b + c (2) a + b − c

(3) c − a − b (4) c + a − b

Scan or tap for the full solution

Q.53 In any fission process the ratio $\frac{\text{mass of fission products}}{\text{mass of parent nucleus}}$ is [AIPMT 2005]

(1) equal to 1

(2) greater than 1

(3) less than 1

(4) depends on the mass of the parent nucleus.

Scan or tap for the full solution

Q.54 Fission of nuclei is possible because the binding energy per nucleon in them [AIPMT 2005]

(1) increases with mass number at low mass numbers

(2) decreases with mass number at low mass numbers

(3) increases with mass number at high mass numbers

(4) decreases with mass number at high mass numbers.

Scan or tap for the full solution

Q.55 Which one of the following pairs of nuclei are isotones ? [AIPMT 2005]

(1) $_{34}Se^{74}$, $_{31}Ga^{71}$ (2) $_{38}Sr^{84}$, $_{38}Sr^{86}$

(3) $_{42}Mo^{92}$, $_{40}Zr^{92}$ (4) $_{20}Ca^{40}$, $_{16}S^{32}$

Scan or tap for the full solution

Q.56 If M(A, Z), M_p and M_n denote the masses of the nucleus $^{A}_{Z}X$, proton and neutron respectively in units of u (1 u = 931.5 MeV/c^2) and BE represents its binding energy in MeV, then [AIPMT 2004]

(1) $M(A, Z) = ZM_p + (A - Z)M_n - BE$

(2) $M(A, Z) = ZM_p + (A - Z)M_n + BE/c^2$

(3) $M(A, Z) = ZM_p + (A - Z)M_n - BE/c^2$

(4) $M(A, Z) = ZM_p + (A - Z)M_n + BE$

Scan or tap for the full solution

Q.57 If in a nuclear fusion process the masses of the fusing nuclei be m_1 and m_2 and the mass of the resultant nucleus be m_3, then [AIPMT 2004]

(1) $m_3 = m_1 + m_2$ (2) $m_3 = |m_1 - m_2|$

(3) $m_3 < (m_1 + m_2)$ (4) $m_3 > (m_1 + m_2)$

Scan or tap for the full solution

Q.58 A nucleus represented by the symbol $^{A}_{Z}X$ has [AIPMT 2004]

(1) Z neutrons and A − Z protons

(2) Z protons and A − Z neutrons

(3) Z protons and A neutrons

(4) A protons and Z − A neutrons

Solution

Q.59 The half life of radium is about 1600 years. Of 100 g of radium existing now, 25 g will remain unchanged after [AIPMT 2004]

(1) 4800 years (2) 6400 years

(3) 2400 years (4) 3200 years

Scan or tap for the full solution

Q.60 Solar energy is mainly caused due to [AIPMT 2003]

(1) burning of hydrogen in the oxygen

(2) fission of uranium present in the Sun

(3) fusion of protons during synthesis of heavier elements

(4) gravitational contraction

Scan or tap for the full solution

Q.61 The volume occupied by an atom is greater than the volume of the nucleus by a factor of about [AIPMT 2003]

(1) 10^1 (2) 10^5 (3) 10^{10} (4) 10^{15}

Scan or tap for the full solution

Q.62 The mass of proton is 1.0073 u and that of neutron is 1.0087 u (u = atomic mass unit). The binding energy of $^{4}_{2}He$ is
(Given helium nucleus mass ≈ 4.0015 u.) [AIPMT 2003]

(1) 0.0305 J (2) 0.0305 erg

(3) 28.4 MeV (4) 0.061 u

Scan or tap for the full solution

Q.63 A sample of radioactive element has a mass of 10 g at an instant t = 0. The approximate mass of this element in the sample after two mean lives is [AIPMT 2003]

(1) 1.35 g (2) 2.50 g (3) 3.70 g (4) 6.30 g

Scan or tap for the full solution

Q.64 The mass number of a nucleus is [AIPMT 2003]

(1) always less than its atomic number

(2) always more than its atomic number

(3) sometimes equal to its atomic number

(4) sometimes less than and sometimes more than its atomic number

Scan or tap for the full solution

Q.65 A nuclear reaction given by
$_{Z}X^{A} \longrightarrow {}_{Z+1}Y^{A} + {}_{-1}e^{0} + \bar{\nu}$ represents [AIPMT 2003]

(1) β-decay (2) γ-decay

(3) fusion (4) fission

Scan or tap for the full solution

Q.66 Which of the following are suitable for the fusion process? [AIPMT 2002]

(1) light nuclei

(2) heavy nuclei

(3) elements lying in the middle of the periodic table

(4) middle elements, which are lying on binding energy curve.

Scan or tap for the full solution

Q.67 A deuteron is bombarded on $_{8}O^{16}$ nucleus, then an α-particle is emitted. The product nucleus is [AIPMT 2002]

(1) $_{7}N^{13}$ (2) $_{5}B^{10}$ (3) $_{4}Be^{9}$ (4) $_{7}N^{14}$

Scan or tap for the full solution

Q.68 A sample of radioactive element containing 4×10^{16} active nuclei. Half-life of element is 10 days, then number of decayed nuclei after 30 days [AIPMT 2002]

(1) 0.5×10^{16} (2) 2×10^{16}

(3) 3.5×10^{16} (4) 1×10^{16}

Scan or tap for the full solution

Q.69 X(n, α) $^{7}_{3}Li$, then X will be [AIPMT 2001]

(1) $^{10}_{5}B$ (2) $^{9}_{5}B$ (3) $^{11}_{4}Be$ (4) $^{4}_{2}He$

Scan or tap for the full solution

Q.70 M_n and M_p represent the mass of neutron and proton respectively. An element having mass M has N neutrons and Z protons, then the correct relation will be [AIPMT 2001]

(1) $M < \{N \cdot M_n + Z \cdot M_p\}$

(2) $M > \{N \cdot M_n + Z \cdot M_p\}$

(3) $M = \{N \cdot M_n + Z \cdot M_p\}$

(4) $M = N\{M_n + M_p\}$

Solution

Q.71 Energy released in nuclear fission is due to [AIPMT 2001]

(1) some mass is converted into energy

(2) total binding energy of fragments is more than the binding energy of parental element

(3) total binding energy of fragments is less than the binding energy of parental element

(4) total binding energy of fragments is equal to the binding energy of parental element

Scan or tap for the full solution

Q.72 Which rays contain (positive) charged particles? [AIPMT 2001]

(1) α-rays (2) β-rays (3) γ-rays (4) X-rays

Scan or tap for the full solution

Q.73 Half life of a radioactive element is 12.5 hours and its quantity is 256 g. After how much time its quantity will remain 1 g? [AIPMT 2001]

(1) 50 h (2) 100 h (3) 150 h (4) 200 h

Scan or tap for the full solution

Q.74 Nuclear fission is best explained by [AIPMT 2000]

(1) liquid drop model

(2) Yukawa π-meson theory

(3) independent particle model of the nucleus

(4) proton-proton cycle

Scan or tap for the full solution

Q.75 For the given reaction, the particle X is

$_{6}C^{11} \longrightarrow {}_{5}B^{11} + \beta^{+} + X$ [AIPMT 2000]

(1) neutron (2) anti neutrino

(3) neutrino (4) proton

Scan or tap for the full solution

Q.76 The relation between λ and $T_{1/2}$ is ($T_{1/2} \longrightarrow$ half-life) [AIPMT 2000]

(1) $T_{1/2} = \frac{\ln 2}{\lambda}$ (2) $T_{1/2} \ln 2 = \lambda$

(3) $T_{1/2} = \frac{1}{\lambda}$ (4) $(\lambda + T_{1/2}) = \ln 2$

Scan or tap for the full solution

ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	**2**	**3**	**2**	**4**	**2**	**1**	**3**	**3**	**3**	**3**	**3**
Ques.	12	13	14	15	16	17	18	19	20	21	22
Ans.	**1**	**3**	**4**	**1**	**4**	**1**	**1**	**4**	**3**	**4**	**4**
Ques.	23	24	25	26	27	28	29	30	31	32	33
Ans.	**3**	**1**	**4**	**3**	**2**	**2**	**3**	**4**	**3**	**3**	**3**
Ques.	34	35	36	37	38	39	40	41	42	43	44
Ans.	**2**	**3**	**1**	**3**	**2**	**4**	**4**	**3**	**3**	**2**	**1**
Ques.	45	46	47	48	49	50	51	52	53	54	55
Ans.	**1**	**3**	**1**	**4**	**3**	**2**	**1**	**3**	**3**	**4**	**1**
Ques.	56	57	58	59	60	61	62	63	64	65	66
Ans.	**3**	**3**	**2**	**4**	**3**	**4**	**3**	**1**	**3**	**1**	**1**
Ques.	67	68	69	70	71	72	73	74	75	76	
Ans.	**4**	**3**	**1**	**1**	**1**	**1**	**2**	**1**	**3**	**1**	

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