Nuclei

1. An element A decays into an element C by a two step process $A \rightarrow B + {}_2He^4$ and $B \rightarrow C + 2e^-$. Then,
(a) A and C are isotopes
(b) A and C are isobars
(c) B and C are isotopes
(d) A and B are isobars

▼ **Answer**

Answer: a

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2. The equation $4_1\ {}^1H^+ \rightarrow 2^4He^{2+} + 2e^- + 26$ MeV
represents
(a) β-decay
(b) γ-decay
(c) fusion
(d) fission

▼ **Answer**

Answer: c

3. Light energy emitted by star is due to
(a) breaking of nuclei
(b) joining of nuclei
(c) burning of nuclei
(d) reflection of solar light

▼ **Answer**

Answer: b

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4. In nuclear reaction, there is conservation of
(a) mass only
(b) energy only
(c) momentum only
(d) mass, energy and momentum

▼ **Answer**

Answer: d

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5. In nuclear reactors, the control rods are made of
(a) cadmium
(b) graphite
(c) krypton
(d) plutonium

▼ **Answer**

Answer: a

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6. The set which represent the isotope, isobar, and isotone respectively is
(a) $(^{2}_{1}H, ^{3}_{1}H)$, $(^{197}_{79}Au, ^{198}_{80}Hg)$ and $(^{3}_{2}H, ^{2}_{1}H)$
(b) $(^{3}_{2}He, ^{1}_{1}H)$, $(^{197}_{79}Au, ^{198}_{80}Hg)$ and $(^{1}_{1}H, ^{3}_{1}H)$
(c) $(^{3}_{2}He, ^{3}_{1}H)$, $(^{2}_{1}H, ^{3}_{1}H)$ and $(^{197}_{79}Au, ^{198}_{80}Hg)$
(d) $(^{2}_{1}H, ^{3}_{1}H)$, $(^{3}_{2}He, ^{3}_{1}H)$ and $(^{197}_{79}Au, ^{198}_{80}Hg)$

▼ **Answer**

Answer: d

▼ **Answer**

Answer: c

7. The mass number of iron nucleus is 56 the nuclear density is
(a) 2.29×10^{16} kg m^{-3}
(b) 2.29×10^{17} kg m^{-3}
(c) 2.29×10^{18} kg m^{-3}
(d) 2.29×10^{15} kg m^{-3}

▼ **Answer**

Answer: b

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8. Order of magnitude of density of uranium nucleus is
(a) 10^{20} kg m^{-3}
(b) 10^{17} kg m^{-3}
(c) 10^{14} kg m^{-3}
(d) 10^{11} kg m^{-3}

▼ **Answer**

Answer: b

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9. The radius of a spherical nucleus as measured by electron scattering is 3.6 fm. What is the mass number of the nucleus most likely to be?
(a) 27
(b) 40
(c) 56
(d) 120

▼ **Answer**

Answer: a

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10. The half life of a radioactive susbtance is 30 days. What is the time taken to disintegrate to $3/4^{th}$ of its original mass?
(a) 30 days
(b) 15 days
(c) 60 days
(d) 90 days

▼ **Answer**

Answer: c

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11. 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

(a) isomer of parent
(b) isotone of parent
(c) isotope of parent
(d) isobar of parent

▼ **Answer**

Answer: c

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12. During negative β-decay, an antineutrino is also emitted along with the emitted electron. Then,
(a) only linear momentum will be conserved
(b) total linear momentum and total angular momentum but not total energy will be conserved
(c) total linear momentum, and total energy but not total angular momentum will conserved
(d) total linear momentum, total angular momentum and total energy will be conserved

▼ **Answer**

Answer: d

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13. An electron emitted in beta radiation originates from
(a) inner orbits of atom
(b) free electrons existing in the nuclei
(c) decay of a neutron in a nuclei
(d) photon escaping from the nucleus

▼ **Answer**

Answer: c

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14. Complete the series $6He \rightarrow e^{-} + {}^{6}Li +$
(a) neutrino
(b) antineutrino
(c) proton
(d) neutron

▼ **Answer**

Answer: b

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15. Consider α and β particles and γ-rays each having an energy of 0.5 MeV. In the increasing order of penetrating power, the radiation are respectively
(a) α, β, γ
(b) α, γ, β
(c) β, γ, α
(d) γ β, α

▼ **Answer**

Answer: a
