

India's Number 1 Education App

PHYSICS

BOOKS - DISHA PHYSICS (HINGLISH)

NUCLEI



1. The energy released per fission of uranium 235 is about 200 MeV. A reactor using U-235 as fuel is producing 1000 kilowatt power. The

number of U-235 nuclei undergoing fission per

sec is, approximately-

A. 10^6

 $\texttt{B.}~2\times10^8$

- ${\rm C.3}\times10^{16}$
- D. 931



2. What is the power output of a $._{92} U^{235}$ reactor if it is takes 30 days to use up 2kg of fuel, and if each fission gives 185MeV of usable energy ?.

A. 5.846 kW

B. 58.46 MW

C. .5846 kW

D. None



3. How many electrons, protons and neutrons are there in a 6 gm of $._6 C^{12}$.

A.
$$6 imes 10^{23}, 6 imes 10^{23}, 6 imes 10^{23}$$

B. $36 imes 10^{23}, 3610^{23}c36 imes 10^{23}$

C. $12 imes 10^{23}, 12 imes 10^{23}, 12 imes 10^{23}$

D. $18 imes 10^{23}, 18 imes 10^{23}, 18 imes 10^{23}$

Answer:

4. The nuclear radius of $._8 O^{16}$ is $3 \times 10^{-15} m$. If an atomic mass unit is $1.67 \times 10^{-27} kg$, then the nuclear density is approximately.

A. $7.5 imes10^{17}kgm^{-3}$

B. $5.7 imes10^{17}kgm^{-3}$

C. $2.3 imes10^{17}kgm^{-3}$

D. $1.66 imes 10^{17} kgm^{-3}$



5. Consider the decay of radium-226 atom into an alpha particle and radon-222. Then, what is the mass defect of the reaction-Mass of radium -226 atom = 226.0256 u Mass of radon - 222 atom = 222.0715 Mass of helium-4 atom=4.0026 u

A. 0.0053 u

B. 0.0083 u

C. 0.083 u

D. None

Answer:

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6. If mass equivalent to one mass of proton is completely converted into energy then determine the energy produced?

A. 931.49 MeV

B. 731.49 MeV

C. 911.49 MeV

D. 431.49 MeV

Answer:



7. If mass equivalent to one mass of electron is completely converted into energy then determine the enrgy liberated.

A. 1.51 MeV

B. 0.51 MeV

C. 3.12 MeV

D. 2.12 MeV

Answer:

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8. If the mass defect in the formation of helium from hydrogen is 0.5%, then the energy obtained, in kWH, in forming helium from 1 kg of hydrogen will be-

A. 1.25

B. $125 imes 10^4$

C. $1.25 imes 10^8$

D. $1.25 imes10^6$

Answer:

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9. The half life of radioactive Radon is 3.8 days. The time at the end of which $\frac{1}{20}th$ of the radon sample will remain undecayed is

 $(given \log e = 0.4343)$

A. 3.8 days

B. 16.5 days

C. 33 days

D. 76 days

Answer:

10. In the nuclear reaction $._{92} U^{238}
ightarrow ._z Th^A + ._2 He^4$, the values of A and Z are.

A. A=234, Z=94

B. A=234, Z=90

C. A=238, Z=94

D. A=238, Z=90



11. The mass defect for the nucleus of helium is 0.0303 a.m.u. What is the binding energy per nucleon for helium in MeV?

A. 7 MeV

B. 14 MeV

C. 3.5 MeV

D. 21 MeV



12. If the binding energy of the deuterium is 2.23 MeV. The mass defect given in a.m.u. is.

A. 0.0024

B. -0.0024

C. -0.0012

D. 0.0012

Answer:

13. The ratio of the radii of the nuclei

 $.^{27}_{13} Al$ and $._{52} Te^{125}$ is approximately

 A. 6: 10

 B. 13: 52

 C. 40: 177

D. 14:73



14. The radius of the $._{30} Zn^{64}$ nucleus is nearly (in fm)-

- B. 2.4
- C. 3.7
- D. 4.8

Answer:

15. How many electrons, protons, and neutrons

are there in a nucleus of atomic number 11 and

mass number 24?

A. 11, 12, 13

B. 11, 11, 13

C. 12, 11, 13

D. 11, 13, 12

Answer:

16. Energy of each photon obtained in the pair production process will be if the mass of electron or positron is 1/2000 a.m.u-

A. 0.213 MeV

B. 0.123 MeV

C. 0.321 MeV

D. 0.465 MeV

Answer:

17. Deuterium is an isotope of hydrogen having a mass of 2.01470 amu. Find binding energy in MeV of this isotope

A. 2.741 MeV

B. 2.174 MeV

C. 1.741 MeV

D. 0.741 MeV



18. The binding energy per nucleon for $._3 Li^7$ will be, if the mass of $._3 Li^7$ is 7.0163 a.m.u.

A. 5.6 MeV

B. 39.25 MeV

C.1 MeV

D. zero

Answer:

19. The sun radiates energy in all directions. The average radiations received on the earth surface from the sun is 1.4kilowatt $/m^2$. The average earth-sun distance is 1.5×10^{11} meters. The mass lost by the sun per day is.

A. $4.4 imes10^9kg$

B. $7.6 imes10^{14}kg$

C. $3.8 imes 10^{12}kg$

D. $3.8 imes 10^{14} kg$



20. Fission of nuclei is possible because the binding energy per nuclei in them

A. increases with mass number at high

mass number

B. decreases with mass number at high

mass number

C. increases with mass number at low mass

numbers

D. decreases with mass number at low

mass numbers

Answer:



21. Half life of Bi^{210} is 5 days. If we start with

50,000 atoms of this isotope, the number of

atoms left over after 10 days is

A. 5000

B. 25000

C. 12500

D. 20000

Answer:

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22. On disintegration of one atom of $.^{235} U$, the amount of energy obtained is 200 MeV. The power obtained in a reactor is 1000 kilo watt. How many atoms are disintegrated per second in the reactor? What is the decay in mass per hour?

A. atoms disintegrated per second in

reactor is $3.125 imes 10^{16}$

B. atoms disintegrated per second in

reactor is $3.125 imes 10^{18}$

C. decay in mass per hour is $4 imes 10^{-8}kg$

D. decay in mass per hour is $4 imes 10^{-6}kg$

23. Which of the following are not examples of nuclear fusion ?

A. Formation of Ba and Kr from U^{235}

B. Formation of Pu-235 from U^{-235}

C. Formation of water from hydrogen and

oxygen

D. Formation of He from H







24. Which of the following are mode of radioactive decay ?

A. Positron emission

B. Electron capture

C. Alpha decay

D. Fusion

Answer:

25. The decay rate of $.^{14} C$ in 1g of carbon in a

living organism is

A. 25 Bq

B. 2.5 Bq

C. 0.25 Bq

D. 5 Bq

Answer:

26. If in an old sample of wood of 10g the decay rate is 30 decays per minute, the age of the wood is

A. 50 years

B. 1000 years

C. 13310 years

D. 15300 years

Answer:

27. The decay rate in another piece is found to

be 0.30 Bq per gm then we can conclude

A. the sample is very recent

B. the observed decay is not that of $._{14} C$

alone

C. there is a statistical error

D. all of these



28. Amongst α , β and γ – particles, α – particle has maximum penetrating power. The α – particle is heavier than β and γ – particle.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation

for Statement-1.

C. Statement -1 is False, Statement-2 is

True.

D. Statement -1 is True, Statement-2 is

False.

Answer:

29. The mass of β – particles when they are emitted is higher than the mass of electrons obtained by other means

eta – particle and electron, both are similar particles.

A. Statement-1 is True, Statement-2 is True, Statement-2 is a correct explanation for Statement-1.

B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation

for Statement-1.

C. Statement -1 is False, Statement-2 is

True.

D. Statement -1 is True, Statement-2 is

False.

Answer:

30. Electron capture occurs more often than positron emission in heavy elements. Heavy elements exhibit radioactivity.

A. Statement-1 is True, Statement-2 is True,

Statement-2 is a correct explanation for

Statement-1.

B. Statement-1 is True, Statement-2 is True,

Statement-2 is NOT a correct explanation

for Statement-1.

C. Statement -1 is False, Statement-2 is

True.

D. Statement -1 is True, Statement-2 is

False.

Answer: