PHYSICS

BOOKS - SURA PHYSICS (TAMIL ENGLISH)

NUCLEAR PHYSICS

Textbook Evaluation Choose The Correct Answer

1. Man-made redioactivity is also known as _____

A. Induced radioactivity

B. Spontaneous radioactivity

C. Artificial radioactivity

D. a & b

Answer: D

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2. Unit of radioactive is _____

A. roentgen

B. curie

C. becquerel

D. all of above

Answer: D

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3. Artificial radioactivity was discovered by

_____

A. Becquerel

B. Irene Curie

C. Roentgen

D. Neils Bohr

Answer: B

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4. In which of the following , no change in mass number of the daughter nuclie takes place ?

(i) α decay (ii) β decay

(iii) γ decay (iv) neutron decay

A. (i) is correct

B. (ii) and (iii) are correct

C. (i) and (iv) are correct

D. (ii) and (iv) are correct

Answer: B

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5. _____ isotope is used for the treatment

of cancer.

A. Radio Iodine

B. Radio Cobalt

C. Radio Carbon

D. Radio Nickel

Answer: B

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6. Gamma radiations are dangerous because

_____.

A. it affects eyes & bones

B. it effects tissues

C. it produces genetic disorder

D. it produces enormous amount of heat

Answer: C

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7. _____ aprons are used to protect us from gamma radiations

A. Lead oxide

B. Iron

C. Lead

D. Aluminium

Answer: C

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8. Which of the following statements is/are correct ?

(i)α particles are photons

(ii) Penetrating power of γ radiation is very low

(iii) ionization power is maximum for α rays

(iv) Penetrating power of γ radiation is very high

A. (i)&(ii) are correct

B. (ii)&(iii) are correct

C. (iv) only correct

D. (iii) & (iv) are correct

Answer: D

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9. proton-Proton chain reaction is an example of _____.

    A. Nuclear fission

    B. α-decay

    C. Nuclear fussion

    D. β-decay

Answer: C

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10. In the nuclear reaction $_6X^{12} \xrightarrow{\alpha \text{decay}} {}_ZY^A$ the value of A and Z is _____.

A. 8,6

B. 8,4

C. 4,8

D. cannot be determined with the given data

Answer: B

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11. Reactor Kamini is situated at _____

    A. Kalpakkam

    B. Koodankulam

    C. Mumbai

    D. Rajasthan

Answer: A

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12. Which of the following is/are correct ?

(i) Chain reaction takes place in a nuclear reactor and an atomic bomb.

(ii) The chain reaction in a nuclear reactor is controlled.

(iii) The chain reaction in a nuclear reactor is not controlled.

(iv) No chain reaction takes place in an atom bomb.

   A. (i) only correct

   B. (i)&(ii) are correct

C. (iv) only correct

D. (iii) & (iv) are correct

Answer: B

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Textbook Evaluation Fill In The Blanks

1. One roentgen is equal to _____ disintegrations per second.

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2. Positron is an_____.

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3. Anemia can be cured by _____ isotope.

> ▶ **Watch Video Solution**

4. Abbreviation of ICRP _____

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5. _____ is used to measure exposure rate of radiation in humans.

6. _____ has the greatest penetration power.

7. $_{z}Y^{A} \rightarrow \ _{z+1}Y^{A} + X,$ Then , X is

_____.

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8. $_{z}X^{A} \rightarrow \ _{z}Y^{A}$ This reaction is possible in

_____ decay.

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9. The average energy released in each fusion reaction is about _____J.

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10. Nuclear fusion is possible only at an extremely high temperature of the order of _____K.

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11. The radio isotope of _____ helps to increase the productivity of crops.

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12. If the radiation exposure is 100R, it may cause_____.

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Textbook Evaluation State Whether The Following Statements Are True Or False If False Correct The

1. Plutonium -239 is a fissionable material. : True or False

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2. Elements having atomic number greater than 83 can undergo nuclear fusion. : True or False

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3. Nuclear fusion is more dangerous than nuclear fission. : True or False

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4. Natural uranium U-238 is the core fuel used in a nuclear reactor. : True or False

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5. If a moderator is not present, then a nuclear reactor will behave as an atom bomb. : True or False

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6. During one nuclear fission on an average , 2 to 3 neutrons are produced. State whether true or false.

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7. Einstein's theory of mass energy equivalence is used in nuclear fission and fusion. State whether true or false.

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Textbook Evaluation Match The Following

1.

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2.

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3.

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4.

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5.

Textbook Evaluation Arrange The Following In The Correct Sequence

1. Arrange in descending order, on the basis of their penetration power

Alpha rays, beta rays, gamma rays, cosmic rays

2. Arrange the following in the chronological order of discovery

Nuclear reactor, radioacitivity, artificial radioactivity, discovery of radium.

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Textbook Evaluation Use The Analogy To Fill In The Blanks

1. Spontaneous process: Natural Radioactivity

:: Induced process: _____

2. Nuclear Fusion : Extreme temperature ::

Nuclear fission: _____

3. Increasing crops : Radio phosphorous

Effective functioning of heart : _____

4. If in nature there may not be an element for which the principal quantum number n > 6, then the total possible number of elements will be

A. 100

B. 182

C. 168

D. 174

Answer: B

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1. $_{88}Ra^{226}$ experiences three α-decay . Find the number of neutrons in the daughter element.

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2. A cobalt specimen emits induced radiation of 75.6 millicurie per second. Convert this disintegration into becquerel.

(one curie = $3.7 \times 10^{10} Bq$)

Textbook Evaluation Assertion And Reason

1. Assertion: A neutron impinging on U^{235} , splits it to produce Barium and Krypton.

Reason: U-235 is a fissile material.

   A. If both the assertion and the reason are true and the reason is the correct explanation of the assertion.

B. If both the assertion and the reason are true , but the reason is not the correct explanation of the assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: A

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2. Assertion: In a β-decay, the neutron number decreases by one.

Reason: In β-decay atomic number increases by one.

    A. If both the assertion and the reason are true and the reason is the correct explanation of the assertion.

    B. If both the assertion and the reason are true , but the reason is not the correct explanation of the assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: D

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3. Assertion: Extreme temperature is necessary to execute nuclear fusion.

Reason: In a nuclear fusion, the nuclei of the reactants combine releasing high energy.

A. If both the assertion and the reason are true and the reason is the correct explanation of the assertion.

B. If both the assertion and the reason are true , but the reason is not the correct explanation of the assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: A

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4. Assertion: Control rods are known as 'neutron seeking rods'.

Reason: Control rods are used to perform substained nuclear fission reaction.

A. If both the assertion and the reason are true and the reason is the correct explanation of the assertion.

B. If both the assertion and the reason are true , but the reason is not the correct

explanation of the assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: A

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Textbook Evaluation Answer In One Or Two Word Vsa

1. Who discovered natural radioactivity ?

2. In the nth orbit, the energy of an electron

$$En = -\frac{13.6}{n^2}eV$$ hydrogen atom. The energy

required to take the electron from first orbit to

second orbit will be

A. 10.2 eV

B. 12.1 eV

C. 13.6 eV

D. 3.4 eV

Answer: A

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3. Write any two elements which are used for inducing radioactivity ?

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4. Write the name of the electromagnetic radiation which is emited during a natural radioactivity .

5. If A is a radioactive element which emits an α -particle and produces $_{104}Rf^{259}$. Write the atomic number and mass number of the element A.

6. What is the average energy released from a single fission process ?

7. Which hazardous radiation is the cause for the genetic disease ?

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8. What is the amount of radiation that may cause death of a person when exposed to it ?

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9. When and where was the first nuclear reactor built ?

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10. Give the SI unit of radioactivity .

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11. Which material protects us from radiation ?

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1. Write any three features of natural and artificial radioactivity.

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2. Define critical mass.

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3. Define one roentgen.

4. The size of an atom is of the order of

A. $10^{-8} \, m$

B. $10^{-10} \, m$

C. $10^{-12} \, m$

D. $10^{-14} \, m$

Answer: B

5. Give the function of control rods in a nuclear

reactor.

6. In Japan, some of the new born children are

having congenital diseases . Why ?

7. Mr. Ramu is working as an X-ray technician in a hospital . But, he does not wear the lead aprons. What suggestion will you give to Mr. Ramu ?

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8. What is stellar energy ?

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9. Give any two uses of radio isotopes in the field of agriculture ?

Textbook Evaluation Answer The Following Questions In Detail

1. In the following atoms and moleculates for the transition from n= 2 to n = 1, the spectral line of minimum wavelength will be produced by

A. Hydrogen atom

B. Deuterium atom

C. Uni-ionized helium

D. di-ionized lithium

Answer: D

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2. Compare the properties of alpha, beta, and gamma radiations.

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3. What is a nuclear reactor ? Explain its essential parts with their functions.

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Textbook Evaluation Hot Questions

1. Mass number of a radioactive element is 232 and its atomic number is 90. When this element undergoes certain nuclear reactions, it

transforms into an isotope of lead with a mass number 208 and an atomic number 82. Determine the number of alpha and beta dacay that can occur.

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2. X- ray should not be taken often'. Give the reason.

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3. Cell phone towers should be placed far away from the residential area-why ?

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Government Exam Questions Answers

1. In the Bohr's hydrogen atom model, the radius of the stationary orbit is directly proportional to

(n = principle quantum number)

A. n^{-1}

B. n

C. n^{-2}

D. n^2

Answer: D

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2. The energy required to knock out the electron in the third orbit of a hydrogen atom is equal to

A. $13.6 \ eV$

B. $+ \dfrac{13.6}{9} \ eV$

C. $- \dfrac{13.6}{3} \ eV$

D. $- \dfrac{3}{13.6} \ eV$

Answer: B

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1. An electron has a mass of 9.1×10^{-31} kg . It revolves round the nucleus in a circular orbit of radius 0.529×10^{-10} $metre$ at a speed of 2.2×10^6 m/s. The magnitude of its linear momentum in this motion is

    A. 1×10^{-34} kg-m/s

    B. 2.0×10^{-24} kg-m/s

    C. 4.0×10^{-24} kg-m/s

    D. 4.0×10^{-31} kg-m/s

Answer: B

2. The control rod in a nuclear reactor is made

of _____.

    A. uranium

    B. cadmium

    C. graphite

    D. plutonium

Answer: B

3. Atomic nucleus was discovered by

_____.

A. Rutherford

B. Newton

C. Einstein

D. Nobel

Answer: A

4. The explosion of the atomic bomb takes place due to _____.

A. Nuclear fission

B. Newton

C. Scalteling

D. Heating

Answer: A

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5. Energy generation in starts is due to

_____.

A. chemical reaction

B. fission

C. fusion of light nuclei

D. fusion of heavy nuclei

Answer: C

6. Fusion reaction is initiated with the help of

_____.

(i) low temp (ii) high temp

(iii) low press (iv) high press

    A. (i) is correct

    B. (ii) & (iv) are correct

    C. (i) and (iv) are correct

    D. (ii) and (iv) are correct

Answer: D

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7. Fusion reaction takes place at high temp

_____.

A. atoms are ionised

B. molecules break up

C. nuclei break up

D. to overcome repulsion between nuclei

Answer: D

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8. The main source of stellar energy is

_____.

(i) fission reactors (ii) fusion reaction

(iii) chemical reaction

(iv) thermonuclear reaction

    A. (i) is correct

    B. (i)&(ii) are correct

    C. (i) and (iv) are correct

    D. (ii) and (iv) are correct

Answer: D

9. In a beryllium atom, if a_0 be the radius of the first orbit, then the radius of the second orbit will be in general

A. na_0

B. a_0

C. $n^2 a_0$

D. $\dfrac{a_0}{n^2}$

Answer: C

10. Nucleons are made of _____.

    A. atoms

    B. electrons and protons

    C. electrons and neutrons

    D. protons and neutrons

Answer: D

11. Henry Becquerel discovered _____ in 1896.

    A. nucleus

    B. atom

    C. isotopes

    D. radioactivity

Answer: D

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12. Elements having atomic number greater than _____ are radioactive.

A. 48

B. 68

C. 88

D. 83

Answer: D

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13. Positively charged radioactive rays are called

_____ rays.

    A. α

    B. β

    C. γ

    D. neutral

Answer: A

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14. γ rays are _____ in charge.

A. positive

B. negative

C. neutral

D. none

Answer: C

▶ Watch Video Solution

15. α-rays consist of α-particles, which are _____ nuclei.

A. hydrogen

B. helium

C. heavy water

D. boron

Answer: B

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16. Penetration power is the greatest in _____ rays.

A. alpha

B. beta

C. gamma

D. helium

Answer: C

17. _____ rays contain 1-unit of negative charge.

A. Alpha

B. Beta

C. Gamma

D. Hydrogen

Answer: B

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18. β-rays are nothing but _____.

    A. protons

    B. neutrons

    C. electrons

    D. helium

Answer: C

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19. Gamma-rays are ____ in nature.

A. gravitational

B. electromagnetic

C. weak

D. nuclear

Answer: B

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20. $_4Be^9 + _2He^4 \rightarrow _6C^{12} + ?$
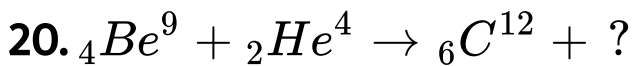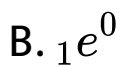
A. electron

B. proton

C. neutron

D. hydrogen

Answer: C

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21. Complete the reaction :

$$_{88}Ra^{226} \rightarrow {}_{86}Rn^{222} + ?$$

A. $_{-1}e^0$

B. $_1e^0$

C. $_2He^4$
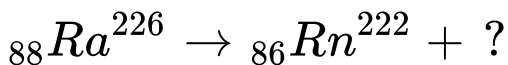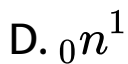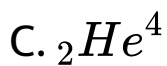
D. $_0n^1$

Answer: C

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22. Complete the reaction :

$$_{90}Th^{234} \rightarrow {}_{91}Pa^{234} + ?$$

A. $_2He^4$
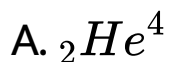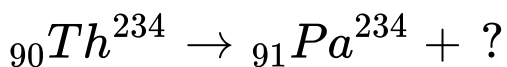
B. $_{-1}e^0$

C. $_1e^0$

D. $_0n^1$

Answer: B

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23. Gamma rays are extensively used to destroy

_____ affected cells.

A. Sickle-cell anemia

B. Cancer

C. HIV

D. Polio virus

Answer: B

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24. Irene Curie and F. Joliot discovered _____ in the year 1934.

A. natural radioactivity

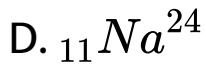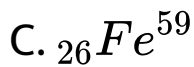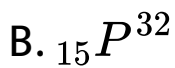B. fluorescence

C. Artificial radioactivity

D. hydrogen bomb

Answer: C

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25. Which of the following is used to detect the

presence of block in blood vessels ?

A. $_{15}P^{31}$

B. $_{15}P^{32}$

C. $_{26}Fe^{59}$

D. $_{11}Na^{24}$

Answer: D

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26. Radio iostope _____ is used in the treatment of cancer.

A. sodium

B. cobalt

C. iron

D. phosphorus

Answer: B

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27. Radio isotope _____ is used to treat problems related to the thyroid gland.

A. sodium

B. cobalt

C. iron

D. iodine

Answer: D

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28. Radio_____ is used to locate brain

tumors.

A. iron

B. iodine

C. indium

D. cobalt

Answer: B

▶ **Watch Video Solution**

29. Radio_____ is used in the treatment of skin
diseases .

A. iron

B. phosphorus

C. sodium

D. iodine

Answer: B

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30. Radio-carbon dating can be done with

_____.

A. only living things

B. only non-living thing

C. both (a) and (b)

D. none

Answer: B

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31. Radio-carbon dating is used to _____.

A. treat diseases

B. increase agricultural yield

C. sterilize

D. determine the age of a specimen

Answer: D

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32. In molecular biology, radioiostope are used

in_____ surgical instruments .

A. engraving

B. sterilizing

C. sharpening

D. preserving

Answer: B

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33. Roentgen (R) is the unit to measure _____.

A. X-ray strength

B. number of holes produced by X-rays

C. radiation exposure

D. number of cancer cells.

Answer: C

34. The ionization potential for second He electron is

A. 13.6 eV

B. 27.2 eV

C. 54.4 eV

D. 100 eV

Answer: C

35. The ionization potential for Lithium ion is

A. 86.6 eV

B. 100.4 eV

C. 136.3 eV

D. 122.4 eV

Answer: D

36. _____ R is the safe limit of radiation exposure per week .

A. 25 milli

B. 2.5 milli

C. 250 milli

D. 2500 milli

Answer: C

37. Radioactive materials are kept in thick-walled _____ containers.

A. aluminium

B. iron

C. brick

D. lead

Answer: D

38. Controlled chain reaction is seen in _____

A. atom bombs

B. nuclear reactors

C. synchroton

D. detectors

Answer: B

39. In Uncontrolled chain reactions, the number

of fission producing neutron is _____

    A. indefinite

    B. finite and a variable

    C. a constant

    D. variable

Answer: A

40. The energy required to remove an electron

in a hydrogen atom from n=10 state is

    A. 13.6 eV

    B. 1.36 eV

    C. 0.136 eV

    D. 0.0136 eV

Answer: C

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41. Chain reaction is possible only when the loss of neutrons is _____ the neutrons produced.

A. less than

B. greater than

C. equal to

D. independent of

Answer: A

42. Minimum size of a system in which at least 1 neutron is available for further fission is called_____.

    A. cut-off size

    B. critical size

    C. range of reactor

    D. capability criteria

Answer: B

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43. Chain reaction is possible , only if the size of system is _____ the critical size.

A. less than

B. greater than

C. equal to

D. independent of

Answer: B

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44. Natural uranium consists of _____ % of U^{235} and _____ % of U^{238}.

A. 0.72, 99.28

B. 99.28, 0.72

C. 77.28 , 72

D. 72, 77.28

Answer: A

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45. U^{238} is fissionable _____ neutrons.

A. only by fast
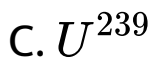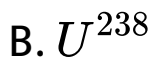
B. only by slow

C. both fast and slow

D. by thermal

Answer: A

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46. _____ is fissionable by neutrons of all energies.

A. U^{235}

B. U^{238}

C. U^{239}

D. Np^{239}
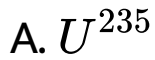
Answer: A

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47. Atom bomb explosions produce_____

waves.

A. gravitational

B. sand

C. shock

D. electric

Answer: C

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48. The first nuclear reavtor was built at _____

A. Newyork

B. San Fransisco

C. New Jersey

D. chicago

Answer: D

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49. In order to supply neutrons for research purpose , we use _____ reactors.

A. research

B. power

C. production

D. source

Answer: A

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50. For production of radio-isotopes , we use
_____ reactions.

A. research

B. power

C. production

D. absorber

Answer: A

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51. A good _____ slows down neutrons by elastic collisions and it does not remove them by absorption.

A. fuel

B. moderator

C. coolant

D. control rod

Answer: B

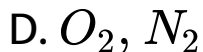**52.** Commonly used moderators are _____ and _____.

A. D_2O, H_2O

B. D_2, H_2

C. O_2, H_2

D. O_2, N_2
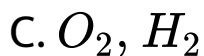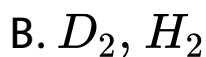
Answer: A

53. Graphite is used as a _____ in nuclear reactors.

A. moderator

B. coolant

C. detector

D. fuel

Answer: A

54. _____ are used to control the chain reaction.

A. control rods

B. Moderators

C. Coolants

D. Neutron source

Answer: A

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55. The moderator used in nuclear reacton is

_____.

A. Cadmium

B. Boron oxide

C. Heavy water

D. Uranium

Answer: C

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56. Which of the following is not a moderactor?

A. liquid sodium

B. ordinary water

C. graphite

D. Heavy water

Answer: A

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57. The coolant used in fast breeder reactor is

_____.

A. ordinary water

B. heavy water

C. liquid sodium

D. boron carbide

Answer: C

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58. In nulcear reactors, _____ convert fast neutrons into slow neutrons.

A. source

B. control rods

C. moderators

D. sink

Answer: C

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59. In a nuclear reactor, cadmium rods are used to _____.

    A. speed up neutrons

    B. slow down neutrons

    C. absorb neutrons

    D. remove heat

Answer: C

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60. Mass of the fissile material at the critical size is called_____.

A. cut-off mass

B. Einstein's mass value

C. Curie mass

D. Critical mass

Answer: D

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61. _____ prevents the leakage of neutrons be reflecting them back.

A. Mirrors

B. Glass

C. Neutron reflectors

D. Coolant

Answer: C

62. BARC(Bhabha Atomic Research Centre) is situated at _____.

    A. Trombay

    B. Kalpakkam

    C. Trivandrum

    D. Thumba

Answer: A

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63. Reactor Kamini is situated at _____

    A. Trombay

    B. Kalpakkam

    C. Trivandrum

    D. Cochin

Answer: B

▶ **Watch Video Solution**

64. Every series of hydrogen spectrum has an upper and lower limit in wavelength. The spectral series which has an upper limit of wavelength equal to 18752 Å is

    A. Balmer series

    B. Lyman series

    C. Paschen series

    D. Pfund series

Answer: C

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65. An electron has a mass of 9.1×10^{-31} kg. It revolves round the nucleus in a circular orbit of radius 0.867×10^{-12} $metre$ at a speed of 4.8×10^8 m/s. The magnitude of its linear momentum in this motion is

    A. 4.368×10^{-22} kg-m/s

    B. 2.834×10^{-34} kg-m/s

    C. 4.368×10^{-24} kg-m/s

    D. 2.834×10^{-32} kg-m/s

Answer: A

---

66. Nuclear fusion is possible only at an extremely high temperature of the order of _____K.

A. 10^{17}

B. 10^7

C. 10^{10}

D. 10^3

Answer: B

67. The mass of the product nucleus is always _____the sum of masses of the lighter nuclei.

A. less than

B. greater than

C. equal to

D. the product of the product nucleus

Answer: A

Additional Questions Answer Fill In The Blanks

1. The ionization potential for carbon atom is

    A. 788.8 eV

    B. 549.3 eV

    C. 375.2 eV

    D. 489.6 eV

Answer: D

2. The kinetic energy of the electron in an orbit of radius r in hydrogen atom is (e = electronic charge)

A. $\dfrac{e^2}{r^2}$

B. $e^2/2r$

C. $\dfrac{e^2}{r}$

D. $e^2/2r^2$

Answer: B

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3. Nuclear Power is the _____ largest source of power in India.

> ▶ **Watch Video Solution**

4. _____ Atomic Power Station is India's first nuclear power station.

> ▶ Watch Video Solution

5. Total number of power station in India is

_____.

6. Number of _____ reactors operating in

India are _____.

7. Name the nuclear power stations are established in India.

> ▶ Watch Video Solution

8. Ionization potential of hydrogen atom is 13.6 eV. Hydrogen atoms in the ground state are excited by monochromatic radiation of photon energy 12.1 eV. The spectral lines emitted by hydrogen atoms according to Bohr's theory will be

A. One

B. Two

C. Three

D. Four

Answer: C

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9. Radioactive elements radium and Polonium were discovered by _____.

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10. The angular momentum of electron in nth

orbit is given by

A. nh

B. $\dfrac{h}{2\pi n}$

C. $n \cdot \dfrac{h}{2\pi}$

D. $n^2 \cdot \dfrac{h}{2\pi}$

Answer: C

11. The ratio of the energies of the hydrogen atom in its first to second excited state is

A. 1/4

B. 4/9

C. 9/4

D. 4

Answer: C

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12. The Rydberg's constant R for hydrogen is

A. $R = -\left(\dfrac{1}{4\pi\varepsilon_0}\right) \cdot \dfrac{2\pi^2 me^2}{ch^2}$

B. $R = \left(\dfrac{1}{4\pi\varepsilon_0}\right) \cdot \dfrac{2\pi^2 me^4}{ch^2}$

C. $R = \left(\dfrac{1}{4\pi\varepsilon_0}\right)^2 \cdot \dfrac{2\pi^2 me^4}{c^2 h^2}$

D. $R = \left(\dfrac{1}{4\pi\varepsilon_0}\right)^2 \cdot \dfrac{2\pi^2 me^4}{ch^3}$

Answer: D

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13. In Rutherford scattering experiment, what will be the correct angle for α-scattering for an impact parameter, b=0 ?

A. 90°

B. 270°

C. 0°

D. 180°

Answer: D

14. What is the radius of iodine atom (At. no. 53, mass no. 126)

    A. $2.5 \times 10^{-11} m$

    B. $2.5 \times 10^{-9} m$

    C. $7 \times 10^{-9} m$

    D. $7 \times 10^{-6} m$

Answer: A

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15. The total energy of an electron in an atom in an orbit is -3.4 eV. Its kinetic and potential energies respectively are :

A. -3.4 eV, -3.4 eV

B. −3.4 eV, -6.8 eV

C. 3.4 eV, -6.8 eV

D. 3.4 eV, 3.4 eV

Answer: C

16. The radius of the first emitted Bohr orbit, for the electron, in a hydrogen atom equals 0.51 Å and its ground state energy equals -13.6 eV. If the electron in the hydrogen atom is replaced by muon (μ^-) [charge same as electron and mass 207 m_e], the first Bohr radius and ground state energy will be

A. $2.46 \times 10^{-13} m, \ - 13.6 keV$

B. $0.53 \times 10^{-13} m, \ - 3.6 keV$

C. $24.6 \times 10^{-13} m, \ - 2.8 keV$

D. $2.46 \times 10^{-13} m, \ - 2.8 keV$

Answer: D

17. The ratio of kinetic energy to the total energy of an electron in a Bohr orbit of the hydrogen atom is

    A. 1:1

    B. 1:-1

    C. 1:-2

    D. 2:-1

Answer: B

---

18. The ratio of wavelengths of the last line of Balmer series and the last line of Lyman series is :-

A. 1

B. 4

C. 0.5

D. 2

Answer: B

19. Given the value of Rydberg constant is 10^7 m^{-1}, the wave number of the last line of the Balmer series in hydrogen spectrum will be:

    A. $0.025 \times 10^4 \ m^{-1}$

    B. $0.5 \times 10^7 \ m^{-1}$

    C. $0.25 \times 10^7 \ m^{-1}$

    D. $2.5 \times 10^7 \ m^{-1}$

Answer: C

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20. When an _____ is emitted, a new atomic nuclei is formed whose atomic number decreases by two and only energy level changes.

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21. Two particles of masses m_1, m_2 move with initial velocities u_1 and u_2. On collision, one of the particles gets excited to higher level, after absorbing energy ε. If final velocities of particles be v_1 and v_2, then v must have

A.

$$\frac{1}{2}m_1u_1^2 + \frac{1}{2}m_2u_2^2 = \frac{1}{2}m_1v_1^2 + \frac{1}{2}m_2v_2^2 - \varepsilon$$

B.

$$\frac{1}{2}m_1u_1^2 + \frac{1}{2}m_2u_2^2 - \varepsilon = \frac{1}{2}m_1v_1^2 + \frac{1}{2}m_2v_2^2$$

C.

$$\frac{1}{2}m_1^2 u_1^2 + \frac{1}{2}m_2^2 u_2^2 - \varepsilon = \frac{1}{2}m_1^2 v_1^2 + \frac{1}{2}m_2^2 v_2^2$$

D. $m_1^2 u_1 + m_2^2 u_2 - \varepsilon = m_1^2 v_1 + m_2^2 v_2$

Answer: B

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22. When a radioactive nucleus disintegrates by emitting a _____ atomic number increases by one and mass number remains the same.

23. Hydrogen atom in ground state is excited by a monochromatic radiation of $\lambda = 975\text{Å}$. Number of spectral lines in the resulting spectrum emitted will be

A. 3

B. 2

C. 6

D. 10

Answer: C

24. I Becequerel=_____ disintegrations per second.

25. Consider 3rd orbit of He+ (Helium), using non- relativistic approach, the speed of electron in this orbit will be [given

$K = 9 \times 10^9$ constant, $Z = 2$ and h (Planck's Constant)=$6.6 \times 10^{-34} Js$]

A. $1.46 \times 10^6 \ m/s$

B. $0.46 \times 10^6 \ m/s$

C. $3.0 \times 10^8 \ m/s$

D. $2.92 \times 10^6 \ m/s$

Answer: A

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26. Curie is defined as the quantity of radioactive substance which gives _____ disintegrations per second.

27. The activity of one gram of radium is equal to _____.

28. Artificial radioactivity was discovered by

_____

29. In the spectrum of hydrogen, the ratio of the longest wavelength in the Lyman series to the longest wavelength in the Balmer series is

A. $\dfrac{9}{4}$

B. $\dfrac{27}{5}$

C. $\dfrac{5}{27}$

D. $\dfrac{4}{9}$

Answer: C

30. Electron in hydrogen atom first jumps from third excited state to second excited state and then from second excited to the first excited state. The ratio of the wavelengths $\lambda_1 : \lambda_2$ emitted in the two cases is

A. $\dfrac{7}{5}$

B. $\dfrac{27}{20}$

C. $\dfrac{27}{5}$

D. $\dfrac{20}{7}$

Answer: D

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31. In the hydrogen spectrum, the ratio of the longest wavelength in the Balmer series to the longest wavelength in the Paschen series is

A. $\dfrac{20}{7}$

B. $\dfrac{7}{20}$

C. $\dfrac{23}{5}$

D. $\dfrac{5}{23}$

Answer: B

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32. In the spectrum of hydrogen, the ratio of the longest wavelength in the Lyman series to the longest wavelength in the Paschen series is

A. $\dfrac{109}{7}$

B. $\dfrac{7}{108}$

C. $\dfrac{7}{109}$

D. $\dfrac{108}{7}$

Answer: B

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33. The radioactive isotope used to diagnose anaemia is _____.

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34. An electron of a stationary hydrogen atom passes from the fifth energy level to the ground level. The velocity that the atom acquired as a result of photon emission will be :

A. $24hR/25m$

B. $25hR/24m$

C. $25m/24hR$

D. $24m/25hR$

Answer: A

35. The transition from the state n=3 to n=1 in a hydrogen like atom results in ultraviolet radiation. Infrared radiation will be obtained in the transition from:

    A. $2 \rightarrow 1$

    B. $3 \rightarrow 2$

    C. $4 \rightarrow 2$

D. $4 \rightarrow 3$

Answer: D

▶ **Watch Video Solution**

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36. The radioactive isotope used in estimating the age of specimens is _____.

▶ **Watch Video Solution**

37. The wavelength of the first line of Lyman series for hydrogen atom is equal to that of the second line of Balmer series for a hydrogen like ion. The atomic number Z of hydrogen like ion is

   A. 3

   B. 4

   C. 1

   D. 2

Answer: D

38. An electron in the hydrogen atom jumps from excited state n to the ground state. The wavelength so emitted illuminates a photosensitive material having work function 2.75 eV. If the stopping potential of the photoelectron is 10 V, the value of n is

A. 3

B. 4

C. 5

D. 2

Answer: B

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39. Out of the following which one is not a possible energy for a photon to be emitted by hydrogen atom according to Bohr's atomic model?

A. 1.9 eV

B. 11.1 eV

C. 13.6 eV

D. 0.65 eV

Answer: B

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40. The energy of a hydrogen atom in the ground state is -13.6 eV. The energy of a He^+ ion in the first excited state will be

A. - 13.6 eV

B. - 27.2 eV

C. - 54.4 eV

D. - 6.8 eV

Answer: A

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41. The ionization energy of the electron in the hydrogen atom in its ground state is 13.6 eV. The atoms are excited to higher energy levels to emit radiations of 6 wavelengths. Maximum

wavelength of emitted radiation corresponds to the transition between

A. n= 3 to n= 1 states

B. n=2 to n= 1 states

C. n= 4 to n= 3 states

D. n= 3 to n= 2 states

Answer: C

42. The process in which of one element is converted into nucleus of another element is _____.

43. The ground state energy of hydrogen atom is -13.6eV. When its electron is in the first excited state, its excitation energy is

A. 3.4 eV

B. 6.8 eV

C. 10.2 eV

D. 0

Answer: C

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44. The total energy of an electron in the first excited state of hydrogen atom is about –3.4 eV. Its kinetic energy in this state is

A. 3.4 eV

B. 6.8 eV

C. -3.4 eV

D. -6.8 eV

Answer: A

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45. The total energy of an electron in the first excited state of hydrogen atom is about -3.4 eV. Its potential energy in this state is

A. 3.4 eV

B. 6.8 eV

C. -3.4 eV

D. -6.8 eV

Answer: D

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46. Percentage of U^{238} in natural uranium is

_____.

▶ Watch Video Solution

47. Percentage of U^{235} in natural uranium is

_____.

48. Energy E of a hydrogen atom with principal quantum number n is given by $E_n = -\dfrac{13.6}{n^2} eV$. The energy of photon ejected when the electron jumps from n=3 state to n=2 state of hydrogen is approximately

A. 1.9eV

B. 1.5eV

C. 0.85 eV

D. 3.4 eV

Answer: A

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49. The first nuclear reactor was built in

_____.

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50. Reactors that converts fertile material into fissile material are called _____.

51. An electron changes its position from orbit n=2 to the orbit n=4 of an atom. The wavelength of the emitted radiations is (R = Rydberg's constant)

A. $\dfrac{16}{R}$

B. $16/3R$

C. $16/5R$

D. $16/7R$

Answer: B

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52. An electron changes its position from orbit $n=3$ to the orbit $n=4$ of an atom. The wavelength of the emitted radiations is (R = Rydberg's constant)

A. $\dfrac{144}{R}$

B. $144/3R$

C. $144/5R$

D. $144/7R$

Answer: D

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53. The energy of hydrogen atom in nth orbit is E_n. Then the energy in nth orbit of single ionised helium atom will be

A. $4E_n$

B. $\dfrac{E_n}{4}$

C. $2E_n$

D. $\dfrac{E_n}{2}$

Answer: A

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54. In the Bohr model of a hydrogen atom, the

centripetal force is furnished by the coulomb

attraction between the proton and the

electron. If a_0, is the radius of the ground state orbit, m is the mass, e is the charge on the electron and ε_0 is the vacuum permittivity, the speed of the electron is

A. 0

B. $\dfrac{e}{\sqrt{\varepsilon_0 a_0 m}}$

C. $\dfrac{e}{\sqrt{4\pi\varepsilon_0 a_0 m}}$

D. $\dfrac{\sqrt{4\pi\varepsilon_0 a_0 m}}{e}$

Answer: C

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55. In which of the following systems will the radius of the first orbit (n=1) be minimum ?

    A. Hydrogen atom

    B. Doubly ionized lithium

    C. Singly ionized helium

    D. Deuterium atom

Answer: B

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56. In which of the following systems will be the radius of the first orbit ($n = 1$) be minimum ?

    A. Hydrogen atom

    B. Singly ionized helium

    C. Doubly ionized lithium

    D. Carbon atom

Answer: D

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57. _____ was the first chairman of the Atomic Energy Commission of India.

58. An electron changes its position from orbit n=2 to the orbit n=3 of an atom. The wavelength of the emitted radiations is

A. $\dfrac{36}{R}$

B. $\dfrac{36}{3R}$

C. $\dfrac{36}{5R}$

D. $\dfrac{36}{7R}$

Answer: C

> ▶ **Watch Video Solution**

59. When hydrogen atom is in it's first excited level, its radius is _____ it's ground state radius.

A. Half

B. Same

C. Twice

D. Four times

Answer: D

60. In the Bohr's hydrogen atom model, the radius of the stationary orbit is directly proportional to

(h = Planck's constant)

A. h^{-1}

B. h

C. h^{-2}

D. h^2

Answer: D

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61. When a hydrogen atom is raised from the ground state to an excited state

A. P.E increases and K.E. decreases

B. P.E. decreases and K.E increases

C. both K.E. and P.E. increase

D. both K.E. and P.E. decrease

Answer: A

▶ **Watch Video Solution**

62. The radius of hydrogen atom in it's ground state is $5.3 \times 10^{-11} m$. After collision with an electron, it is found to have a radius of

$21.2 \times 10^{-11}m.$ What is the principal quantum number n of the final state of the atom ?

    A. $n = 4$

    B. $n = 2$

    C. $n = 16$

    D. $n = 3$

Answer: B

▶ **Watch Video Solution**

63. The radius of hydrogen atom in it's ground state is $4 \times 10^{-13}m$. After collision with an electron, it is found to have a radius of $64 \times 10^{-13}m$. What is the principal quantum number n of the final state of the atom ?

    A. $n = 4$

    B. $n = 2$

    C. $n = 16$

    D. $n = 3$

Answer: A

64. The radius of hydrogen atom in it's ground state is $0.1 \times 10^{-7}m$. After collision with an electron, it is found to have a radius of $25.6 \times 10^{-7}m$. What is the principal quantum number n of the final state of the atom ?

    A. $n = 4$

    B. $n = 2$

    C. $n = 16$

D. $n = 3$

Answer: C

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65. In the Bohr's hydrogen atom model, the radius of the stationary orbit is inversely proportional to

(m = electron rest mass)

A. m^{-1}

B. m

C. m^{-2}

D. m^2

Answer: A

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66. In the Bohr's hydrogen atom model, the radius of the stationary orbit is inversely proportional to

(e = charge of an electron)

A. e^{-1}

B. e

C. e^{-2}

D. e^2

Answer: C

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67. The energy required to knock out the electron in the fifth orbit of a hydrogen atom is equal to

A. $13.6 eV$

B. $\dfrac{+13.6}{25} eV$

C. $\dfrac{-13.6}{5} eV$

D. $\dfrac{-13.6}{25} eV$

Answer: D

▶ **Watch Video Solution**

68. The energy required to knock out the electron in the seventh orbit of a hydrogen atom is equal to

A. $\dfrac{+13.6}{7} eV$

B. $\dfrac{+13.6}{49} eV$

C. $\dfrac{-13.6}{49} eV$

D. $\dfrac{-13.6}{7} eV$

Answer: C

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69. In terms of Bohr radius a_0, the radius of the second Bohr orbit of a hydrogen atom is given by

A. $4a_0$

B. $8a_0$

C. $\sqrt{2}a_0$

D. $2a_0$

Answer: A

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70. The ionization energy of hydrogen atom is

13.6 eV. Following Bohr's theory, the energy

corresponding to a transition between 2nd and

3rd orbit is

A. 3.40 eV

B. 1.89 eV

C. 0.85 eV

D. 0.66 eV

Answer: B

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71. The elements whose atomic number is more than 83 undergo _____ radioactivity.

▶ **Watch Video Solution**

72. Most of the radioactive elements are_____ and _____ metals.

▶ **Watch Video Solution**

73. Technitium with atomic number _____.

74. The mass of an atom is concentrated in its central part called_____.

75. Henry Becquerel discovered _____ in 1896.

76. _____ is a radioactive element.

▶ **Watch Video Solution**

77. Radium emitted radiations spontaneously like _____.

▶ **Watch Video Solution**

78. _____ is known as an ore of uranium.

▶ **Watch Video Solution**

79. _____ elements emit harmful radioactive radiations.

80. The nucleus of some elements is _____.

81. The nucleus undergo nuclear decay to get converted into a more _____.

82. Promethium with atomic number_____.

  ▶ Watch Video Solution

83. _____ radioactive substances have been

discovered so far.

  ▶ Watch Video Solution

84. The atomic number of Cu is _____.

▶ **Watch Video Solution**

85. The atomic number of Cobalt is _____.

▶ **Watch Video Solution**

86. The atomic number of Chromium is _____.

▶ **Watch Video Solution**

87. The atomic number of Cadmium is _____.

▶ Watch Video Solution

88. The atomic number of Boron is _____.

▶ Watch Video Solution

89. The atomic number of carbon is _____.

▶ Watch Video Solution

90. The atomic number of hydrogen is _____.

▶ Watch Video Solution

91. One roentgen produces a charge of _____ coulomb in 1kg of air.

▶ Watch Video Solution

92. The atomic number of oxygen is _____.

▶ Watch Video Solution

93. The ionizing power of alpha rays is 10,000 times greater than _____.

▶ View Text Solution

94. α-rays are _____ charged.

▶ View Text Solution

95. The charge of each β-particle equal to _____.

96. β-particle are _____ charged.

97. _____ in 400 BC believed that matter is made up of tiny indestructible units called atom.

98. In 1803, _____ considered that elements consists of atoms, which are identical in nature.

▶ View Text Solution

99. J-J Thomson discovered_____.

▶ View Text Solution

100. Cathode rays are known as _____.

▶ View Text Solution

101. _____ were named as protons by Rutherford.

▶ View Text Solution

102. Elementary particles neutron, positron are emitted by _____ radioactivity.

▶ View Text Solution

103. _____ radioactivity can be controlled.

104. The particle which is used to induce artificial disintegration is known as _____.

105. When the projectile hits the parent nucleus, it is converted into an _____

nucleus.

106. Uranium was discovered by _____.

107. _____ are the basic elementary particles

in all atoms.

108. _____ are electrmagnetic waves consisting of photons.

109. The ionizing power of alpha rays is 100 times greater than _____.

110. The nuclear bomb dropped in Hiroshima and Nagasaki are_____.

▶ View Text Solution

111. Sun fuses about _____ tons of hydrogen each second.

▶ View Text Solution

112. When radiation from the sun enters the Earth its value is _____ per unit area in unit time.

▶ View Text Solution

113. The technique used to determine the age of the Earth, fossils , old paintings and monuments is _____.

▶ View Text Solution

114. _____ old is our mother Earth.

▶ View Text Solution

115. In γ-decay , only the energy level of the_____.

▶ View Text Solution

116. During a γ-decay , the atomic number and mass number of the radioactive nucleus will _____.

117. A fissionable material is a _____ element.

118. All isotopes of uranium do not undergo _____ when they absorb neutron.

119. The process of breaking up of heavier nucleus into smaller nuclei with release of large amount of energy is called _____.

▶ View Text Solution

120. A _____ is also known as fissile material.

▶ View Text Solution

121. _____ is non-fissionable.

122. The two types of chain-reaction are

_____ and _____.

123. The energy released due to a controlled

chain reaction can be utilized for _____

purposes.

124. Controlled chain reaction is used in a _____ to produce energy in a sustained and controlled manner.

▶ View Text Solution

125. In the uncontrolled chain reaction, the number of _____ multiplies indefinitely.

▶ View Text Solution

126. _____ chain reaction is used in atom bomb to produce an explosion.

▶ View Text Solution

127. _____depends on the nature , density and size of the fissile material.

▶ View Text Solution

128. The minimum mass of a fissile material necessary to sustain the chain reaction is called _____.

129. If the mass of the fissile material is less than the critical mass is termed as _____.

130. _____ are used to convert non-fissionable materials into fissionable materials.

▶ View Text Solution

131. AEC stands for _____.

▶ View Text Solution

132. AEC is now known as_____.

▶ View Text Solution

133. If the mass of the fissile material is more than the critical mass is termed as _____.

▶ View Text Solution

134. The unit used to measure the energy of smaller particles is _____.

▶ View Text Solution

135. 1eV = _____ joule.

136. 1 MeV = _____ eV.

137. An atom bomb consists of a piece of fissile material whose mass is _____.

138. An atom bomb has a_____ fissile material which can fit into cyclindrical void.

▶ View Text Solution

139. _____ is an isotope of Hydrogen.

▶ View Text Solution

140. Energy can be produced when two lighter nuclei combine to form a heavier nucleus is called as_____.

▶ View Text Solution

141. The relationship between mass and energy can be given by _____.

▶ View Text Solution

142. The velocity of light in vacuum is _____ ms^{-1}.

▶ View Text Solution

143. The bomb dropped at Nagasaki used a _____ core.

▶ View Text Solution

144. The concept of mass-energy equivalence was proposed by _____.

▶ View Text Solution

145. All stars contain a large amount of _____.

▶ View Text Solution

146. _____ or _____ rods are used as control rods.

  ▶ View Text Solution

147. _____ was the first chairman of Indian Atomic Energy Commission.

  ▶ View Text Solution

148. _____ explained that the mass of an atom is concentrated in its central part called nucleus.

▶ View Text Solution

149. Fusion reaction that takes place in the _____.

▶ View Text Solution

150. The Sun radiates about _____ joule of energy per second.

▶ View Text Solution

151. Radio isotopes can be obtained from_____.

▶ View Text Solution

152. The radiations from the radio isotopes can be used to kill the _____ and _____.

▶ View Text Solution

153. _____ are used to detect defects of bone metabolism.

▶ View Text Solution

154. Radio isotopes are used to diagnose the nature of _____.

155. _____ is used for the effective functioning of heart.

156. _____ is used to cure goiter.

157. _____ is used in the treatment of skin diseases.

158. In industries , _____ are used as tracers to detect any manufacturing defects such as cracks and leaks.

159. An isotope of _____ is used in the airlines to detect the explosives in the luggage.

▶ View Text Solution

160. An isotope of _____ is used in many industries as a smoke detector.

▶ View Text Solution

161. The age of the Earth can be determined using _____.

162. The phenomenon of nuclear decay of certain elements with the emission of radiations like α, β, and γ ray is called _____.

163. Spontaneous emulsion of radiation on their own is called _____.

▶ View Text Solution

164. _____ are two elements which are radioactive with atomic number less than 83.

▶ View Text Solution

165. _____ defined as the quantity of one disintegration per seconds.

▶ View Text Solution

1. J.J Thomson discovered nucleus.

▶ View Text Solution

2. Goldstein discovered cathode rays.

▶ **View Text Solution**

3. Henry Becequerel discovered uranium.

▶ **View Text Solution**

4. Elements whose atomic number is less than 83 are undergo spotaneous radioactivity.

▶ **View Text Solution**

5. Irene Curie & Joliot discovered, natural radioactivity.

> ▶ View Text Solution

6. Artificial radioactivity is called natural radioactivity.

> ▶ View Text Solution

7. The SI unit of radioactivity is Curie.

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8. The radiation exposure of γ-ray is measured by Rutherford.

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9. Ionising power of a α-ray is 10,000 times greater than β- rays.

10. Gamma rays are deflected by both electronic and magnetic fields.

11. Beta rays travels with the speed of light.

12. In α-decay atomic number of daughter nucleus is increased by one.

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13. Splitting up of a heavier nucleus into two smaller nuclei is called nuclear fusion.

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14. A radioactive elements is converted into fissionable material are called fissile material.

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15. Controlled chain reaction is used in atom bomb.

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16. Two lighter nuclei combined to form heavier nuclei is nuclear fission.

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17. Nuclear fission is a thermonuclear reaction.

▶ View Text Solution

18. To detect the explosives in the luggage Am^{241} is used.

19. Safe limit of exposure to radiation is 20 milli slevert per month.

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20. When body is exposed to 600 R, it causes total disease.

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21. The function of control rods is to absorb the part of the K.E. of the neutrons.

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22. The nuclear energy is measured in Curie.

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Additional Questions Answer Match The Following

1.

▶ View Text Solution

2.

▶ View Text Solution

3.

▶ View Text Solution

4.

View Text Solution

5.

View Text Solution

6.

View Text Solution

1. Assertion: Radioactive nuclei emit beta particles.

Reason: electron exist inside the nucleus.

A. Both assertion and reason are true and reason is correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of

assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: C

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2. Assertion: $_2X^A$ undergoes 2 α-decay and the

daughter product is $_{z-4}Y^{A-8}$

Reason: In α-decay the mass number decreases

by 4 and atomic number decreases by 2.

A. Both assertion and reason are true and reason is correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: A

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3. Assertion:Among alpha, beta and gamma rays, α-particle has maximum penetrating power.

Reason: The α-particle is heavier than β & γ rays

    A. Both assertion and reason are true and reason is correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: D

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4. Assertion: The ionision power of β-particle is less compared to α-particle but their penetrating power is more.

Reason: The mass of β-particle is less than the mass of α-particle.

 A. Both assertion and reason are true and reason is correct explanation of assertion.

 B. Both assertion and reason are true but reason is not the correct explanation of

assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: B

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5. Assertion: Radioactivity is a spontaneous process.

Reason: Nuclear radiation emission depends on the nature of substance.

A. Both assertion and reason are true and reason is correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: C

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6. Assertion: A cadmium is used for making control rods in nuclear reactors.

Reason: Cadmium is very effective in slowing down the speed of neutrons.

A. Both assertion and reason are true and reason is correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of

assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: C

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7. Assertion: Neutrons are the best bombarding particles.

Reason: Neutrons are neutral particles.

A. Both assertion and reason are true and reason is correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: A

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8. Assertion: The basic principle involved in Hydrogen bomb is nuclear fission.

Reason: Controlling the nuclear fusion is not successful.

    A. Both assertion and reason are true and reason is correct explanation of assertion.

    B. Both assertion and reason are true but reason is not the correct explanation of

assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: D

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9. Assertion: C-14 isotope of carbon is used in carbon dating of rocks, fossils etc.

Reason: Radioactive carbon decays through emission of β- rays.

A. Both assertion and reason are true and reason is correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: A

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10. Assertion: A heavy water acts as a moderator in nuclear reactors.

Reason: Heavy water absorbs fast moving electrons.

    A. Both assertion and reason are true and reason is correct explanation of assertion.

    B. Both assertion and reason are true but reason is not the correct explanation of

assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: C

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11. Assertion : γ-rays have very high penetrating power.

Reason: γ-are high energy radiator.

A. Both assertion and reason are true and reason is correct explanation of assertion.

B. Both assertion and reason are true but reason is not the correct explanation of assertion.

C. Assertion is true, but Reason is false.

D. Assertion is false, but the reason is true.

Answer: A

1. Heavier elements into higher elements: _____::Lighter elements into heavier elements : Nuclear fusion

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2. α-rays: Helium particles :: β-rays:_____

▶ Watch Video Solution

3. James Chadwick : neutrons:: Rutherford : element :_____

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4. Radioactivity element : uranium :: Lighter element :_____

▶ **Watch Video Solution**

5. Natural radioactivity : uncontrolled :: Artificial radioactivity :_____

> ▶ **Watch Video Solution**

6. _____:negative charged particles :: γ-rays : neutral

> ▶ **Watch Video Solution**

7. P^{32} : cure skin disease :: Fe^{59} :_____

8. High ionizing power : α ray :: Low ionizing

power:_____

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9. Fissional material : U^{235}:: Fertile material

:_____

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1. Write in decreasing order, the ionizing property of the given rays.

β-rays, γ-rays, α-rays, I-R rays

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2. Write in ascending order, the radioactive elements according to the atomic number.

N_P , Pu, U, Pa

Additional Questions Answer Answer In Sentence Word

1. What is it called when two atomic nuclei fuse

?

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2. What form of radioactive decay reduces the

atomic number of protons by 2 ?

3. Write the name of the radioactive radiations

which are emitted by the unstable nuclei.

4. How does radioactive material generate

electricity ?

5. Name the nuclear reactors in India.

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6. How do workers at nuclear power plants know whey they've received the maximum amount of radiation deemed safe ?

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7. Give the value of kinetic energy of alpha ray.

> ▶ Watch Video Solution

Additional Questions Answer Very Short Answers

1. Define radioactivity. What are radioactive elements ?

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2. What is meant by Natural Radioactivity ?

▶ **Watch Video Solution**

3. Name the elements which undergoes spontaneous radioactivity .

▶ **Watch Video Solution**

4. What is Artificial Radioactivity (or) Induced Radioactivity ?

▶ **Watch Video Solution**

5. What is meant by leakage of neutrons ?

6. Write the two factors which lead to loss of neutrons .

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7. What is meant by (i) Sub critical (ii) Super critical

▶ **Watch Video Solution**

8. What is meant by mass defect ?

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9. Write the conditions necessary for nuclear fusion.

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10. Name the nuclear power stations in Tamil Nadu .

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11. Write the use of Cf^{252} & Am^{241}

▶ Watch Video Solution

12. What is radio carbon dating ?

▶ Watch Video Solution

13. What is meant by chain reaction ?

▶ Watch Video Solution

1. How does the repulsive force between the two deuterium atoms overcome during nuclei fusion process ?

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2. Why nuclear fusion is called thermonuclear reaction ?

3. Write the principle used in hydrogen bomb ?

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4. Write the use of radioactive isotopes used in industries ?

▶ **Watch Video Solution**

5. Write a note on radiation hazards.

▶ Watch Video Solution

6. Write a note on Dosimeter ?

 ▶ Watch Video Solution

7. Distinguish between fissionable & fertile material.

 ▶ Watch Video Solution

8. Write the types of nuclear reactors ?

▶ **Watch Video Solution**

9. What are the uses of nuclear reactor ?

▶ **Watch Video Solution**

Additional Questions Answer Long Answers

1. Explain the principle & structure of atom bomb.

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2. Explain the uses of radio isotopes in medicine field.

▶ **Watch Video Solution**

3. What are the precautions to be taken by people working in radiation labs ?

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4. Distinguish between Nuclear fission and nuclear fussion.

> ▶ View Text Solution

Additional Questions Answer Numerical Problems

1. Determine the energy produced in the fission reaction whose mass difference is 3.251×10^{-28} kg.

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2. If 50 g was the loss in mass as a result of a fissionable reaction, how much energy will have been produced ?

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3. If the loss in mass during a fission reaction is 0.20 g, how much energy will have been produced ?

4. In the equation $_6C^{14} \rightarrow {}_7N^{14} + {}_{-1}e^0$ which decay of radioactive carbon-14 results in the new nitrogen-14 atom ?

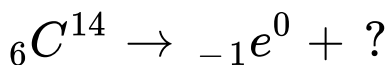**5.** If Gadolinium -150 undergoes through α-decay what is the new atomic mass of the resulting element ?
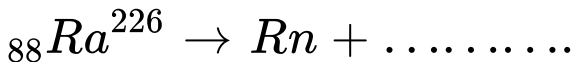
6. Balance the following reaction

$$_6C^{14} \rightarrow _{-1}e^0 + ?$$

7. Which type of radiation requires thick layers of concrete or lead in order to be stopped ?

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8. Solve this equation for α-decay.

$$_{88}Ra^{226} \rightarrow Rn + \ldots\ldots\ldots$$

▶ View Text Solution

9. Solve this equation for β-decay

$$_{27}Co^{60} \rightarrow Ni +$$
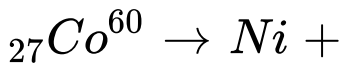
▶ View Text Solution

10. Which unit is a measure of an individual's exposure to gamma radiation ?

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11. Convert 1 Bq into curie.
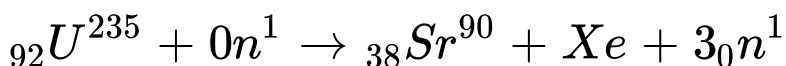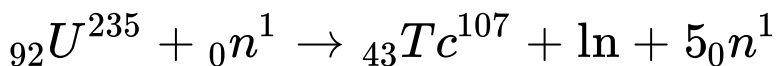
12. Complete the fission reaction:

$$_{92}U^{235} + 0n^1 \rightarrow {}_{38}Sr^{90} + Xe + 3_0n^1$$

13. Complete the fission reaction:

$$_{92}U^{235} + {}_0n^1 \rightarrow {}_{43}Tc^{107} + \text{ln} + 5_0n^1$$

1. Frequency is the most fundamental . Why is heavy water used as a moderator ?

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2. What is the essential difference between an electron and a beta ray ?

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3. Can an electron be obtained (or come out) from the nucleus ?

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4. Why does a metal bar appear hotter than a wooden bar at the same temperature ? Equivalently it also appears cooler than wooden bar if they are both colder than room temperature .

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5. Why do you mean be Q value of nuclear reaction ?