1. BASIC STRUCTURE OF ATOM
SOLUTIONS

TEACHING TASK

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1. The sub-atomic particle with no charge is
A)Electron B)Proton C)Neutron D)Positron.
Answer:C
Solution:Neutrons are neutral (no charge), while protons are positive and electrons are negative.
2. A neutron has approximately the same mass as a _____.
A) an alpha particle B) a beta particle C)an electron D) a proton
Answer:D
Solution:Both neutrons and protons have a mass of ~1 amu, while electrons are much lighter.
3. Almost the entire mass of an atom is concentrated in the _____.
A) protons B)electrons C)nucleus D)neutrons
Answer:C
Solution:The nucleus contains protons and neutrons, which account for nearly all the atom's mass
4. Name an atom in which the nucleus of that atom does not contain any neutrons?
A) Oxygen B) Hydrogen C) Phosphorous D) Sodium
Answer:B
Solution:Ordinary hydrogen (protium) has only 1 proton and no neutrons in its nucleus.
5 The atomic mass of an atom is equal to the number of
A) Protons or electrons B) Protons
C) Electrons and neutrons D) Protons and neutrons
Answer:D
Solution:Mass number (A) = protons (Z) + neutrons (N).
6. If the atomic number of an element is 6 and its mass number is 13, how many protons are contained in the nucleus?
A) 6 B) 7 C) 8 D) 13
Answer:A
Solution:Atomic number = number of protons = 6.
7. Which statement about subatomic particles is not true?
A) An electron has far less mass then either a proton or a neutron.
B) Neutrons have no charge and no mass.
C) Unlike protons or neutrons, electrons have no mass.
D) Protons, neutrons, and electrons all have about the same mass.
Answer:B,C,D
Solution:Neutrons have no charge but do have mass (~1 amu).

c)Electrons do have mass, though very small.Saying "no mass" is incorrect.
d)Electrons are much lighter than protons and neutrons.
8. If atomic number for an element is 5,and its neutrons is equal to 6. calculate its mass number?
A) 10 B)12 C)11 D)13
Answer:C
Solution:Mass number (A) = protons (5) + neutrons (6) = 11.
9. The sub-atomic particle with negligible mass is
A)Proton B)Electron C)Neutron D)None
Answer:B
Solution: Electron mass is ~0.00054 amu (negligible compared to protons/neutrons).
10. Protons and neutrons present in...
A) Nucleus B)Nucleons C)Positrons D)Neutrinos
Answer:A
Solution:Together, protons and neutrons form the nucleus.
MULTIPLE CORRECT ANSWER TYPE
11.Which is /are correct about Electrons?
A)Negatively charged B)0.00054 amu
C)Discovered by J.J.Thomson. D)Present outside the nucleus.
Answer:A,B,C,D
Solution:A) Negatively charged (True).
B) 0.00054 amu (True: electron mass).
C) Discovered by J.J. Thomson (True: 1897 cathode ray experiment).
D) Present outside the nucleus (True: orbit in electron shells).
12. Mass of Proton is /are:
A)1.007 amu B)0.00054amu C)1.008amu D)1.672×10^{-27}kg
Answer:A,D
Solution:In atomic mass units (amu):˜ 1.007 amu
In kilograms (kg):˜ 1.672×10^{-27} kg
STATEMENT TYPE
13. Statement-I:Electrons are having negligible mass.
Statement-II: Mass of electrons is 0.0005 amu.
Answer:A
Solution:Statement-I (Correct):Electrons have a very small mass compared to protons/neutrons (~1/1836 of a proton's mass), so they're considered "negligible" in atomic mass calculations.
Statement-II (Correct):The actual mass of an electron is approximately 0.000548 amu, which matches the given value (rounded to 0.0005 amu).
Relationship:Statement-II provides the quantitative basis for Statement-I's claim about negligible mass.
14. Statement-I:Protons and neutrons are present inside the nucleus.
Statement-II: Nucleus is the small region inside atom with positive charge.
Answer:B

Solution:Statement-I (Correct):Protons and neutrons are indeed located in the nucleus.
Statement-II (Correct but Incomplete Explanation):The nucleus is positively charged due to protons, but this doesn't directly explain why neutrons (which are neutral) are also present in the nucleus.
The correct explanation for Statement-I would involve the strong nuclear force binding protons and neutrons together.

COMPREHENSION TYPE

COMPREHENSION -1:

15. Atoms take part in chemical reactions.they consists of sub-atomic particles like electrons ,protons and neutrons. Nucleons are
A)Only protons B)Only neutrons
C)Both protons and neutrons D)Both electrons and protons.

Answer:C

Solution:The nucleus contains:Protons (positively charged).
Neutrons (neutral/no charge).
Electrons orbit outside the nucleus and are not nucleons.

INTEGER TYPE

16. Mass of electron in amu is ____$x10^{-4}$

Answer:5

Solution:The mass of an electron ˜ 0.000548 amu
In scientific notation:$0.000548=5.48\times10^{-4}$amu

17. Mass number of an element is 14. then its nucleons is _____

Answer:14

Solution:Mass number = Total number of nucleons = protons + neutrons
Mass number = 14

18. Charge of neutron is _____

Answer:0

Solution:Neutrons are electrically neutral, so Charge of neutron is 0.

MATRIX MATCHING TYPE

19. **Answer:A-4,B-1,C-2,D-3**

Solution:

COLUMN-I	COLUMN-II
A)Mass of electron	4.0.0005 amu
B)Mass of proton	1. 1.007 amu
C)Mass of neutron	2. 1.008 amu
D)Charge of nucleus	3. Positive

LEARNERS TASK

CONCEPTUAL UNDERSTANDING QUESTIONS (CUQ's)

1. The protons and neutrons collectively present with in the nucleus are called
A) Protons B) Nucleons C) Mesons D) Neutrinos

Answer:B

Solution: Nucleons include both protons and neutrons, which reside in the

nucleus.
2. What is the mass of one proton?
A) 1 a.m.u B) 1 gram C) 2 kg D) 0.1 kg
Answer:A
Solution:A proton's mass is approximately 1 atomic mass unit (a.m.u) or 1.67×10^{-27} kg.
3. What is the charge of neutron?
A) +1 B) -1 C) Zero D) All of these.
Answer:C
Solution: Neutrons are electrically neutral (no charge).
4. Smallest unit of matter is
A)Molecule B)Atom C)Mixture D)Compound
Answer:B
Solution:Atoms are the smallest units that retain the properties of an element. Molecules/compounds are made of atoms.
5. Atomic number is denoted by
A) A B)N C)Z D)P
Answer:C
Solution: Atomic number (number of protons) is symbolized by Z. Mass number (A) = protons + neutrons.
6. Sum of protons and neutrons is called ……
A)Nucleus B)Mass number C)Atomic number D)Nucleons.
Answer:B
Solution:Mass number (A) = Protons (Z) + Neutrons (N).
7. Atom consists of
A)Electron B)Proton C)Neutron D)All the above
Answer:D
Solution:Atoms contain electrons, protons, and neutrons.
8. Electron was discovered by
A)J.J.Thomson B)Goldstein C)Chadwick D)Rutherford
Answer:A
Solution:J.J. Thomson identified electrons in 1897 via cathode ray experiments.
9. Protons are ……. charged particles.
A) Positive B)Negative C)Neutral D)highly negative
Answer:A
Solution: Protons carry a +1 elementary charge.
10. Nucleus contains …..
A)Electron B)Proton C)Neutron D)Both B and C.
Answer:D
Solution: The nucleus houses protons (B) and neutrons (C). Electrons orbit outside.

JEE MAIN LEVEL QUESTIONS

1. Charge of nucleus is…….
A)+vely charged B)-vely charged C)0 D)None
Answer:A
Solution:The nucleus contains protons (+) and neutrons (neutral), giving it a

positive charge.
2. The proton is heavier than an electron by_____.
A)1850 times B)1840 times C)1000 times D)100 times
Answer:B
Solution:A proton's mass (~1.67×10^{-27} kg) is 1836 times (˜1840) that of an electron (~9.11×10^{-31} kg).
3. Mass number is equal to the_____.
A) number of protons + number of electrons
B) number of protons + number of neutrons
C) number of neutrons + number of electrons
D) number of electrons
Answer:B
Solution: Mass number (A) = Protons (Z) + Neutrons (N). Electrons are negligible in mass.
4. In 1932 who had discovered neutron?
A) J.J Thomson B) James Chadwick C) Goldstein D) Rutherford
Answer:B
Solution:Chadwick identified neutrons in 1932. Thomson discovered electrons, and Rutherford proposed the nucleus.
5. Which of the following is not a fundamental particle?
A) Proton B)Neutron C)Alpha particle D)Electron
Answer:C
Solution:An alpha particle (He^{2+}) is not fundamental—it's made of 2 protons + 2 neutrons. Protons, neutrons, and electrons are fundamental.
6. Which subatomic particle has a negative charge?
A) proton B) electron C) neutron D)nucleus
Answer:B
Solution:Electrons are negatively charged. Protons are positive, and neutrons are neutral.
7. Which of the following are true for an element?
(i) Atomic number = number of protons + number of electrons
(ii) Mass number = number of protons + number of neutrons
(iii) Atomic mass = number of protons = number of neutrons
(iv) Atomic number = number of protons = number of electrons
(A) (i) and (ii) B) (i) and (iii) C) (ii) and (iii) D) (ii) and (iv)
Answer:D
Solution:(ii) Correct: Mass number = protons + neutrons.
(iv) Correct: Atomic number = protons = electrons (in a neutral atom).
8. Mass of neutron is .....g.
A) 1.674×10^{-24} B) 1.674×10^{-27} C)9.1×10^{-24} D)$9.1\times10_{-31}$.
Answer:A
Solution:Neutron mass ˜ 1.675×10^{-24} g (or 1.675×10^{-27} kg).
9. Mass of Proton in ..... amu
A)0.0005 B)1.007 C)1.008 D)0.06
Answer:B

Solution:Proton mass ˜ 1.0073 amu (close to 1.007).
10. Electrons are present ..... the nucleus.
A)inside B)outside C)everywhere D)None
Answer:B
Solution:Electrons orbit outside the nucleus in electron shells.

ADVANCED LEVEL QUESTIONS

MULTIPLE CORRECT ANSWER TYPE

11. Which of the following are correct pair about discoveries?
A) Proton-Goldstein B)Electron-Neils bohr
C)Neutron-James chadwick D)Nucleus-Rutherford.
Answer:A,C,D
Solution:A) Proton – Goldstein
Goldstein discovered canal rays (positive rays), which eventually led to the identification of protons.
B) Electron – Niels Bohr $\rightarrow$ Incorrect
Electron was discovered by J.J. Thomson, not Bohr. Bohr proposed the model of the atom, not the discovery of the electron.
C) Neutron – James Chadwick $\rightarrow$Correct: James Chadwick discovered the neutron in 1932.
D) Nucleus – Rutherford $\rightarrow$Correct: Ernest Rutherford discovered the nucleus through his gold foil experiment.
12. The element with atomic number 8 contains :
A)8 electrons B)6 electrons C)8 protons D)6 protons.
Answer:A,C
Solution:Element with atomic number 8 is Oxygen.
Atomic number = number of protons = 8
In a neutral atom, number of electrons = protons = 8

COMPREHENSION TYPE

COMPREHENSION -I:

13. Atoms take part in chemical reactions.they consists of sub-atomic particles like electrons ,protons and neutrons.
i). Charge of proton is:
A)+1 B)-1 C)+2 D)-2
Answer:A
Solution:A proton carries a positive charge of +1 elementary charge

COMPREHENSION - II:

14. The sum of protons and neutrons in the nucleus of an atom is called Mass number. The no. of protons or no of electrons in an atom is called Atomic number.
i) An element X have atomic number 6 and number of neutrons is 7 .What is its mass number?
A)14 B)12 C)13 D)14
Answer:C
Solution:Atomic number = number of protons = 6
Number of neutrons = 7
Mass number = protons + neutrons = 6 + 7 = 13

ii). Atomic number is equal to
A) no.of electrons B)no. of protons C)no.of neutrons D)Both A & B
Answer:D
Solution:Atomic number is defined as the number of protons in an atom.
In a neutral atom, the number of electrons = protons.
INTEGER TYPE
15. No. of electrons with an atom having atomic number 10 is _____
Answer:10
Solution:Atomic number = number of protons = 10
In a neutral atom, number of electrons = protons
So, number of electrons = 10
MATRIX MATCHING TYPE
16 . **Answer:A-4,B-3,C-2,D-1**
Solution:

COLUMN-I	COLUMN-II
A) Electron	4. J.J.Thomson
B)Proton	3. Goldstein
C)Neutron	2. James Chadwick
D)Nucleus	1. Rutherford

KEY

					TEACHING TASK				
1	2	3	4	5	6	7	8	9	10
C	D	C	B	D	A	B,C,D	C	B	A
11	12	13	14	15	16	17	18	19	
A,B,C,D	A,D	A	B	C	5	14	0	A-4,B-1,C-2,D-3	
					LEARNERS TASK				
					CUQ'S				
1	2	3	4	5	6	7	8	9	10
B	A	C	B	C	B	D	A	A	D
				JEE MAIN LEVEL QUESTIONS					
1	2	3	4	5	6	7	8	9	10
A	B	B	B	C	B	D	A	B	B
				ADVANCED LEVEL QUESTIONS					
11	12	13	14-i	14-ii	15	16			
A,C,D	A,C	A	C	D	10	A-4,B-3,C-2,D-1			