CHEMISTRY

BOOKS - MTG IIT JEE FOUNDATION

FOOTSTEPS TOWARDS (JEE MAIN)

Section A Multiple Choice Questions

1. Which of the following elements has same number of protons, electrons and neutrons?

A. Al

B. Mg

C. P

D. Cl

Answer: B

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2. Hydrogen was passed over heated 2 g copper oxide till only copper was left. The

mass of copper obtained was 1.6 g. The percentage of oxygen in copper oxide is

A. 80 %

B. 60 %

C. 40 %

D. 20 %

Answer: D

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3. Chromatography method is used to separate

    A. two or more immiscible liquids

    B. volatile impurities

    C. a volatile solid from a non-volatile liquid

    D. a non-volatile solid from a volatile liquid

Answer: D

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4. Which of the following phenomena shows that diffusion has occurred?

1. Balloons deflate and become smaller.

2. The aroma of coffee spreads through the air.

3. A puddle of water disappears on hot days.

    A. 1 and 3

    B. 1 and 2
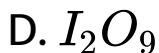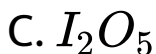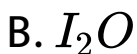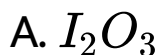
    C. 1,2 and 3

    D. 2, and 3

Answer: B

5. An oxide of iodine (I =127) contains 25.4g of iodine and 8g of oxygen. Its formula could be

A. I_2O_3

B. I_2O

C. I_2O_5

D. I_2O_9

Answer: C

6. The atomic mass of the lead is 208u and its atomic number is 82, the atomic mass of bismuth is 209u and its atomic number is 83. The ratio of the neutrons / protons

A. is higher is lead than bismuth

B. is lower in lead than bismuth

C. is equal in both lead and bimuth

D. does not depend on the above data.

Answer: A

7. Match the column I with column II and choose the correct option.

Column I (Molecule)		Column II (Mass ratio of elements)
(A) Water (H : O)	(i)	14 : 3
(B) Ammonia (N : H)	(ii)	1 : 8
(C) Carbon dioxide (C : O)	(iii)	1 : 1
(D) Sulphur dioxide (S : O)	(iv)	3 : 8

A. A-II,B-I,C-IV,D-III

B. A-III,B-II,C-I,D-IV

C. A-I,B-IV,C-III,D-II

D. A-IV,B-III,C-II,D-I

Answer: A

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8. The element which becomes liquid at a temperature slightly above the room temperature is

A. caesium

B. silicon

C. iodine

D. sodium

Answer: A

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9. Which of the following have the same number of valence electrons?

A. N,Li,Na,C

B. He,Mg,Be,Ca

C. B,Al,N,P

D. O,S,Se,Rb

Answer: B

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10. How many moles of electrons weigh one kilogram?

(Mass of electron $= 9.108 \times 10^{-31}$ kg, Avogadro's number $= 6.023 \times 10^{23}$)

A. $\dfrac{1}{9.108 \times 6.022} \times 10^{8}$

B. 6.022×10^{23}

C. $\dfrac{1}{9.108} \times 10^{31}$

D. $\dfrac{6.022}{9.108} \times 10^{54}$

Answer: A

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11. At temperature T_1, the particles of substance X vibrate in fixed positions.

At temperature T_2, the particles move about

freely but are still close to one another.

Which change of state has taken place from T_1 to T_2 ?

A. Boiling

B. Condensation

C. Freezing

D. Melting

Answer: D

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12. State which of the following is not a property of an element?

I. On heating gives off a gas and leaves a residue.

II. Burns in air to form carbon dioxide and water.

III. Changes into solid at 273 K and to a gas at 373K.

  A. I
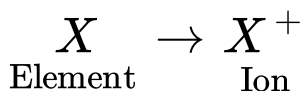
  B. II and III

  C. I and III

D. I,II,III

Answer: D

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13. The reaction given below shows an atom of element X being changed into an ion :

$$\underset{\text{Element}}{X} \rightarrow \underset{\text{Ion}}{X^{+}}$$

Consider the following statements.

I. One electron is lost.

II. The ion is cation.

III. The ion is smaller than the atom.

Identify the correct option.

A. I only
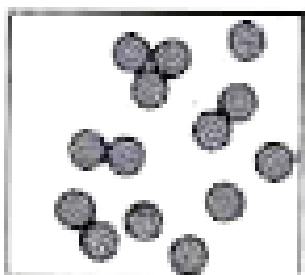
B. I and II only

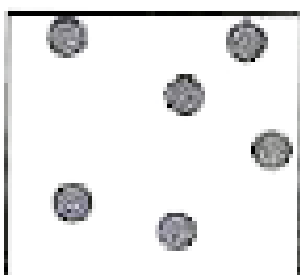C. II and III only

D. I,II and III

Answer: D

14. The diagrams show the arrangement of particles of a substance at temperatures $20°C$ and $40°C$

What are the likely melting and boiling points of the substance?

At 20°C   At 40°C

	Melting point $/°C$	Boiling piont $/°C$
A.	-12	35
B.	-25	45

	Melting point $/°C$	Boiling piont $/°C$
C.	-98	100
D.	44	80

Answer: A

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15. Which of the following is not a colloid ?
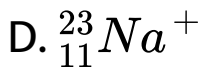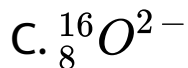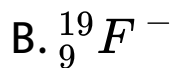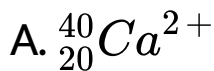
A. Sugar syrup

B. Fog

C. Milk

D. Cheese

Answer: A

16. The table given shows the number of protons, neutrons and electrons in four ions.

For which ion is the data correct?

Ion	Number of		
	Protons	Neutrons	Electrons
$^{40}_{20}Ca^{2+}$	20	20	20
$^{19}_{9}F^-$	9	10	8
$^{16}_{8}O^{2-}$	8	8	10
$^{23}_{11}Na^+$	11	12	11

A. $^{40}_{20}Ca^{2+}$

B. $^{19}_{9}F^{-}$

C. $^{16}_{8}O^{2-}$

D. $^{23}_{11}Na^{+}$

Answer: C

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17. The weight of a molecule of the compound

$C_{60}H_{122}$ is
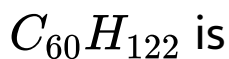
A. $1.4 \times 10^{-21} g$

B. $1.09 \times 10^{-21} g$

C. $5.025 \times 10^{23} g$

D. $16.023 \times 10^{23} g$

Answer: A

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18. Distillation involves all the following

processes except

A. change of state

B. boiling

C. condensation

D. evaporation

Answer: D

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Section B Numerical Value Type Questions

1. The number of sodium ions in 53g of Na_2CO_3 is $x \times 10^{23}$. The value of x is

_____.

(Atomic masses : Na = 23u, C = 12u, O = 16u)

2. Calculate the mass of water (in g) required to make 250g of 25% solution of glucose.

3. Ammonia gas diffuses x times faster than hydrogen chloride gas. The value of x is _____.

(Given, molecular masses of ammonia and hydrogen chloride are 17u and 36.5u respectively.)

4. Number of protons , neutrons and electrons in four species A,B,X and Y are respectively

6,6,6, 7,7,7, 6,8,6 and 9,10,10. How many of them

are isobars?

5. The formula of chloride of a metal M is

MCl_3, then the number of oxygen atoms in

the formula of the phosphate of metal M will

be _____.

6. A sample of water was heated from $50°C$ to 328K. The rise in temperature on the Fahrenheit scale is _____.

7. In the C-12 and C-14 isotopes, the ratio of neutrons is x : y , then $x + y$ is _____.

8. A compound contians 3×10^{24} oxygen atoms. Number of moles of oxygen present in the sample is _____.

9. The solubility of common salt in water at 293K is 36g. The mass (in g) of common salt needed to make a saturated solution in 20g water at 293 K is _____.

10. Mass of 270g block of iron displaces a volume of 30 mL of a liquid. The density (in g / mL) is _____.