

DPP No. # 01 (JEE-MAIN)

Total Marks : 60

Max. Time : 40 min.

Single choice Objective ('-1' negative marking) Q.1 to Q.20

(3 marks, 2 min.)

[60, 40]

TOPIC : MOLE CONCEPT

Ques. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
Mark obtained																						

- 1 mole by definition represents same number of particles as :
 (A) Number of atoms present in exactly 8 g of $^{16}_8\text{O}$ isotope.
 (B) Number of molecules in exactly 2 g of H_2 gas.
 (C) Number of atoms present in exactly 16 g of $^{16}_8\text{O}$ isotope.
 (D) Number of atoms present in exactly 12 g of $^{12}_6\text{C}$ isotope.
- The weight of a molecule of the compound $\text{C}_6\text{H}_{12}\text{O}_6$ is about :
 (A) 180 g (B) 3×10^{-22} g (C) 22×10^{-23} g (D) 132 g
- The mass of half mole of electrons is about : (Given : Mass of electron = 9.1×10^{-28} g)
 (A) 0.546 mg (B) 0.273 mg (C) 1.092 mg (D) 4.55 mg
- 39.4 kg of gold was recovered from a smuggler. The number of atoms of gold recovered are :
 (A) 200 (B) 1.2044×10^{25} (C) 6.022×10^{25} (D) 1.2044×10^{26}
- The charge on 1 gram of Al^{3+} ions is : (e = magnitude of electronic charge)
 (A) $\frac{1}{27} N_A e$ coulomb (B) $\frac{1}{3} N_A e$ coulomb (C) $\frac{1}{9} N_A e$ coulomb (D) $3 N_A e$ coulomb
- The number of atoms present in 0.5 g atoms of nitrogen is same as the atoms in :
 (A) 24g of Mg (B) 8g of Oxygen gas (C) 32g of S (D) 12g of C
- In which of the following pairs, do 1 g of each have an equal number of molecules ?
 (A) N_2O and CO (B) N_2 and CO (C) N_2O and CO_2 (D) Both (B) and (C)
- The number of atoms in 4.25 g of NH_3 is approximately :
 (A) 1×10^{23} (B) 2×10^{23} (C) 4×10^{23} (D) 6×10^{23}
- Total number of neutrons present in 4 g of heavy water (D_2O) is : (Where N_A represents Avogadro's number)
 (A) $2.4 N_A$ (B) $4 N_A$ (C) $1.2 N_A$ (D) $2 N_A$
- In which of the following options, the molecules are correctly matched with their atomicity ?
 (1) P_4 (p) 7
 (2) HNO_3 (q) 6
 (3) N_2H_4 (r) 5
 (4) H_2SO_4 (s) 4
 (A) (1 - s), (2 - r), (3 - p), (4 - q) (B) (1 - q), (2 - s), (3 - p), (4 - r)
 (C) (1 - q), (2 - s), (3 - r), (4 - p) (D) (1 - s), (2 - r), (3 - q), (4 - p)
- The atomic weight of an element is 'a'. If this element occurs in nature as a triatomic gas, then the correct formula for the number of moles of gas in its 'w' g is :
 (A) $\frac{3w}{a}$ (B) $\frac{w}{3a}$ (C) $3wa$ (D) $\frac{a}{3w}$

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12. 124 g of P_4 will contain which of the following :
 (1) 4 atoms of Phosphorus
 (2) $4N_A$ atoms of Phosphorus
 (3) N_A molecules of Phosphorus
 (4) 1 molecule of Phosphorus
 (A) 1 and 4
 (B) 2 and 3
 (C) 1 and 3
 (D) 2 and 4
13. Among the following samples, select the sample which contains maximum number of atoms.
 (A) 4 gm of oxygen
 (B) 2 gm atoms of nitrogen
 (C) 32 gm of sulphur
 (D) 108 gm of silver
14. A gaseous mixture contains oxygen and sulphur dioxide in the ratio of 1 : 4 by mass. Therefore, the ratio of their respective number of molecules is :
 (A) 1 : 2
 (B) 1 : 4
 (C) 2 : 1
 (D) 4 : 1
15. Sulphur exist in different allotropic forms like S_2 , S_6 and S_8 etc. If equal moles of these three forms are taken in separate containers, then the ratio of number of atoms present in them respectively is :
 (A) 1 : 3 : 4
 (B) 1 : 1 : 1
 (C) 12 : 4 : 3
 (D) 4 : 3 : 1
16. Which of the following has least mass ?
 (A) 2 gram-atom of Nitrogen
 (B) 3×10^{23} atoms of Carbon
 (C) 1 mole of Sulphur atoms
 (D) 7 g of Silver
17. Which of the following has least mass ?
 (A) 2 gram-molecules of CO_2
 (B) 1.2044×10^{24} molecules of CH_3COOH
 (C) 3 moles of NH_2CONH_2
 (D) 80 g of $CaCO_3$
18. Which of the following contains the greatest number of atoms ?
 (A) 1 g of butane (C_4H_{10})
 (B) 1 g of nitrogen (N_2)
 (C) 1 g of silver (Ag)
 (D) 1 g of water (H_2O)
19. Cinnabar (HgS) is a prominent ore of mercury. How many grams of mercury are present in 464g of pure HgS .
 (A) 200 g
 (B) 400 g
 (C) 160 g
 (D) None of these
20. The number of F^- ions in 2.1g AlF_3 is ($N_A = 6 \times 10^{23}$)
 (A) 1.5×10^{22}
 (B) 6×10^{22}
 (C) 3×10^{22}
 (D) 4.5×10^{22}

DPP No. # 02 (JEE-ADVANCED)

Total Marks : 60

Max. Time : 40 min.

Single choice Objective ('-1' negative marking) Q.1 to Q.4	(3 marks, 2 min.)	[12, 08]
Multiple choice objective ('-1' negative marking) Q.5 to Q.7	(4 marks, 2 min.)	[12, 06]
Comprehension ('-1' negative marking) Q.08 to Q.11	(3 marks, 2 min.)	[12, 08]
Integer type Questions ('-1' negative marking) Q.12 to Q.15	(4 marks, 3 min.)	[16, 12]
Match the Following (no negative marking) Q.16	(8 marks, 6 min.)	[08, 06]

TOPIC : MOLE CONCEPT

Ques. No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Total
Mark obtained																	

- A gaseous mixture contains SO_2 & CO_2 , average molecular mass of mixture may be

(A) 64 (B) 44 (C) 54 (D) 70
- An element is found in nature in two isotopic forms with mass numbers $(A-1)$ and $(A+3)$. If the average atomic mass of the element is found to be A , then the relative abundance of the heavier isotope in the nature will be :

(A) 66.6% (B) 75% (C) 25% (D) 33.3%
- A hypothetical element Z exists in nature as two isotopes ^{65}Z and ^{67}Z with their relative abundances 25% and 75% respectively. Then, the average atomic mass (in u) of element Z is :

(A) 65.5 (B) 66 (C) 66.25 (D) 66.5
- What is the ratio of weights of O_2 and SO_2 , the mixture of which contains equal number of molecules of each gas?

(A) 1 : 8 (B) 8 : 1 (C) 1 : 2 (D) 2 : 1
- 360 amu of Glucose ($\text{C}_6\text{H}_{12}\text{O}_6$) contains :

(A) 2 moles of glucose molecules (B) 24 hydrogen atoms
(C) 12 moles of carbon atoms (D) 2 glucose molecules
- Equal mass of O_2 and O_3 gases contain the same number of :

(A) atoms (B) molecules (C) protons (D) moles of given species
- If 42 g of an unknown gas X occupies a volume of 125 L at 0.3 bar pressure and 300 K temperature, then the gas X could be :

(A) N_2 (B) CO_2 (C) CO (D) NO_2

Comprehension # 1

Consider a sample containing $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$

- Mass of nitrogen present in sample if mass of oxygen present is 11.2 g

(A) 1.4 g (B) 2.8 g (C) 28 g (D) 14 g
- Number of gm molecules of $(\text{NH}_4)_2\text{Cr}_2\text{O}_7$, present in the sample if mass of hydrogen obtained from the sample is 2g.

(A) $0.25 N_A$ (B) 0.25 (C) $0.125 N_A$ (D) 0.125

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Comprehension # 2

In a container equal number of moles of ethene and sulphur dioxide are present at 760 mm Hg pressure and 546K temperature.

10. The ratio of carbon atoms to oxygen atoms present in container will be :
(A) 2 : 1 (B) 1 : 2 (C) 1 : 1 (D) 3 : 2
11. If all ethene molecules are replaced by same number of molecules of ethyne, then molar mass of the gaseous mixture will be
(A) 46 g (B) 45 g (C) 60 g (D) 32 g
12. Calculate mass of carbon in 0.01 mole of $K_4[Fe(CN)_6]$. Report your answer after dividing by 0.08.
13. What is the number of gram atoms of oxygen in 6.023×10^{24} CO-molecule.
14. A gaseous mixture contains $SO_3(g)$ and $CH_4(g)$ in 25 : 1 ratio by mass. What is ratio of total number of atoms present in $SO_3(g)$ to total number of atoms present in $CH_4(g)$ in the mixture.
15. A gaseous mixture is composed of equal number of moles of CH_4 , C_2H_6 and C_2H_2 . Determine the average molecular mass of mixture (in amu).

16. Match the column :

Column-I

- A. 1 mole $(NH_4)_2CO_3$
- B. 0.5 mole NH_2CONH_2
- C. 1 mole C_6H_5N
- D. 1 mole C_9N_6

Column-II

- p. moles of carbon atom is less than 1
- q. Mass of oxygen is greater than 16g in sample
- r. at least two elements have same number of atoms in given sample
- s. Number of neutron and protons are same.
- t. moles of nitrogen atom is greater than 1

ANSWER KEY (PHYSICAL CHEMISTRY)

DPP NO. - 01

1.	(D)	2.	(B)	3. 2	(B)	4.	(D)	5. 2	(C)	6.	(B)	7. 2	(D)
8.	(D)	9. 2	(D)	10.	(D)	11.	(B)	12.	(B)	13.	(B)	14. 2	(A)
15. 2	(A)	16.	(B)	17.	(D)	18.	(A)	19.	(B)	20. 2	(D)		

DPP NO. - 02

1. 2	(C)	2. 2	(C)	3.	(D)	4.	(C)	5.*	(B)(D)	6.* 2	(A)(C)	7.* 2	(A)(C)
8.	(B)	9. 2	(B)	10.	(C)	11. 2	(B)	12.	9	13.	10	14. 2	4
15. 2	24	16.	A → q, t; B → p, r; C → No match; D → s, t										

DPP NO. - 03