Multiple Choice Questions

[MHT-CET 2018]

1. Which symbol replaces the unit of atomic mass, amu ?
   a) u b) A c) M d) n

2. What is the SI unit of density ?
   a) g cm^{-3} b) g m^{-3} c) Kg m^{-3} d) Kg cm^{-3}

[MHT-CET 2019]

3. The temperature of 32°C is equivalent to
   a) 69 °F b) 70 °F c) 85.6 °F d) 89.6 °F

[MHT-CET 2021]

4. Find the value of – 197°C temperature in kelvin.
   a) 47 K b) 76 K c) 470 K d) 760 K

[MHT-CET 2022]

5. What is the density of water in Kg dm^{-3} if its density in g cm^{-3} is 0.863 ?
   a) 0.863 b) 7.86 c) 8.63 d) 4.60

6. What is the value of temperature in degree fahrenheit if the temperature in degree celsius is 60 ?
   a) 65 °F b) 140 °F c) 108 °F d) 33 °F

Law of chemical combinations

[MHT-CET 2019]

7. The combining ratios of hydrogen and oxygen in water and hydrogen peroxide are 1 : 8 and 1 : 16. Which law is illustrated in this example ?
   a) Law of definite proportion
   b) Gay Lussac's Law of combining volume of gases
   c) Law of conservation of mass
   d) Law of multiple proportions.

[MHT-CET 2020]

8. The volume of oxygen required for complete combustion of 0.25 mole of methane at STP is
   a) 22.4 dm^3 b) 5.6 dm^3 c) 11.2 dm^3 d) 7.46 dm^3

9. Pure sample of copper carbonate synthesized in laboratory and found naturally it both contains 51.35 % copper, 38.91 % carbon and 9.74 % oxygen by weight. This is an accordance with
   a) Law of definite proportion b) Law of conservation of mass
   c) Law of multiple proportion d) Law of combining volume

10. Which of the following sets of compounds does NOT demonstrate the law of multiple proportions ?
    a) H_2O, H_2O_2 b) SO_2, SO_3 c) H_2O, CO_2, CH_4 d) NO, NO_2

11. At constant temperature and pressure when 8 volumes of dihydrogen gas reacts with 4 volumes of dioxygen the mass of water vapour produced is
a) 72 g b) 162 g c) 144 g d) 36 g

[MHT-CET 2021]

12. Which of the following pairs of compounds explains law of multiple proportions?
a) H_2 and O_2 b) CO and CO_2
c) N_2 and O_2 d) $HClO_4$ and $NaClO_4$

13. What volume is occupied by 24g methane at STP ?
a) 33.6 dm^3 b) 22.4 dm^3 c) 67.2 dm^3 d) 44.8 dm^3

14. What is the mass of 44.8 dm^3 of methane gas under STP conditions ?
a) 24 g b) 32 g c) 48 g d) 16 g

15. Which of the following pairs of compounds does not explain law of multiple proportions?
a) SO_2 and SO_3 b) O_2 and O_3 c) CO and CO_2 d) H_2O and H_2O_2

16. What amount of oxygen is used at STP to obtain 9 g water from sufficient amount of hydrogen gas ?
a) 5.6 dm^3 b) 22.4 dm^3 c) 16.8 dm^3 d) 11.2 dm^3

17. "Mass can neither be created nor destroyed" is the statement of
a) Gay Lussac law of gaseous volume b) Law of definite proportion
c) Law of conservation of mass d) Law of multiple proportions.

18. What is the volume (in dm^3) occupied by 75 g ethane at STP ?
a) 60.0 b) 56.0 c) 22.4 d) 44.8

19. What is the volume occupied by 16 g methane gas at STP ?
a) 1140 cm^3 b) 22400 cm^3 c) 214 cm^3 d) 12.4 cm^3

20. How many molecules of ammonia gas are present in 67.2 dm^3, measured at STP ?
a) 2.0×10^{24} b) 1.0×10^{23} c) 1.8×10^{24} d) 5.0×10^{24}

21. How many molecules are present in 22400 cm^3 of a gas at STP ?
a) 22.4×10^{20} b) 6.022×10^{23} c) 6.022×10^{20} d) 22.4×10^{23}

[MHT-CET 2022]

22. What is the number of CO_2 molecules in 45.42 litres at STP ?
(Consider molar volume of gas at STP = 22.7 L mol^{-1})
a) 1.806×10^{24} b) 1.501×10^{24} c) 0.913×10^{24} d) 1.204×10^{24}

23. How many moles of oxygen gas at STP are equivalent to 5.6 litres ?
a) $\frac{1}{8}$ moles b) $\frac{1}{2}$ moles c) 1 mole d) $\frac{1}{4}$ moles

24. What is the volume occupied by 32 g methane gas at STP ?
a) 33.6 dm^3 b) 22.4 dm^3 c) 56.0 dm^3 d) 44.8 dm^3

25. Find the quantity of hydrogen required to prepare 2 L ammonia gas from 1 L dinitrogen.
a) 2 L b) 1 L c) 3 L d) 3/2 L

26. What volume of water vapour will be produced when 10 volumes of dihydrogen gas react with 5 volumes of dioxygen gas ?
a) 100 b) 5 c) 10 d) 50

27. Nitrogen gas reacts with hydrogen to produce ammonia. What is the ratio of reacting volumes of nitrogen, hydrogen and ammonia gas respectively according to Gay - Lussac law ?
a) 1 : 2 : 3 b) 3 : 2 : 2 c) 1 : 3 : 2 d) 2 : 1 : 3

Atomic masses, molecular masses, molar masses and mole concepts

[MHT-CET 2019]

28. Number of gram atoms of an element present in one atom of the element is
a) 1.66×10^{-23} b) 6.022×10^{23} c) 1.66×10^{-24} d) 6.022×10^{22}

29. How many moles of ammonia are present in 5.6 cm^3 of ammonia gas at STP ?
a) 4.5×10^{-4} mole b) 2.0×10^{-4} mole
c) 3.9×10^{-3} mole d) 2.5×10^{-4} mole

30. What is $\frac{1}{12}$ th mass of one atom of C^{12} ?
a) 166.05×10^{-26} g b) 6×10^{-27} g c) 12×10^{-24} g d) 1.6605×10^{-27} g

31. The number of molecules present in 100 ml of water is (Given, Density of water = 1 g/cc)
a) 33.45×10^{23} b) 3.345×10^{23} c) 1.083×10^{24} d) 1.083×10^{23}

32. The volume of 1 mole of any pure gas at standard temperature and pressure is always equal to
a) 22.414 m^3 b) 0.022414 m^3 c) 2.2414 m^3 d) 0.22414 m^3

[MHT-CET 2020]

33. Which gas among the following contains maximum number of molecules at STP ? (molar masses in g mol^{-1} : $CO_2 = 44$, Ar = 39.9, $CH_4 = 16$, $O_2 = 32$)
a) 13.3 g of Ar b) 11 g of CO_2 c) 24.0 g of O_2 d) 16.0 g of CH_4

34. What are the number of moles and total number of atoms respectively present in 5.6 cm^3 of ammonia gas at STP ?
a) 1.505 mol and 6.022×10^{20} atoms
b) 2.05 mol and 1.50×10^{20} atoms
c) 2.50×10^{-4} mol and 6.022×10^{20} atoms
d) 2.50×10^{-3} mol and 1.5×10^{20} atoms

35. How many atoms of argon are present in 3.99 g of it ? (Atomic mass = 39.9)
a) 6.022×10^{22} b) 3.011×10^{21} c) 3.011×10^{22} d) 3.011×10^{23}

36. How many moles of methane are present in 11.2 L at STP ?
a) 0.5 mole b) 0.25 mole c) 0.12 mole d) 0.6 mole

37. Calculate mass of 3.01×10^{24} atoms of an element having atomic mass 21.13
a) 118.5 g mol^{-1} b) 105.65 g mol^{-1} c) 84.54 g mol^{-1} d) 42.27 g mol^{-1}

38. The number of moles of ammonia present in 5.6 dm^3 of its volume at STP is?
a) 0.25 b) 1.0 c) 0.50 d) 0.75

[MHT-CET 2021]

39. What is the total number of molecules present in 224 cm^3 of a gas at STP ?
a) 6.022×10^{20} b) 6.022×10^{23} c) 6.022×10^{22} d) 6.022×10^{21}

40. Number of molecules present in 5.4 g of urea is (molar mass = 60 g mol^{-1})
a) 6.0×10^{22} b) 5.4×10^{22} c) 9.0×10^{22} d) 3.5×10^{23}

41. How many atoms of argon are present in 52 moles of it ? (At. mass of Ar = 39)
a) 1.1×10^{23} b) 1.5×10^{25} c) 3.1×10^{25} d) 1.2×10^{23}

42. How many moles of urea are present in 5.4 g ? (molar mass = 60)
a) 2.9 b) 0.09 c) 1.2 d) 2.4

43. What is the mass of 33.6 dm^3 of methane gas at STP ?
a) 4.8×10^{-2} kg b) 3.3×10^{-2} kg c) 1.6×10^{-2} kg d) 2.4×10^{-2} kg

44. How many grams of H_2O are present in 0.25 mol of it ?
a) 0.25 g b) 5.4 g c) 4.5 g d) 6.1 g

[MHT-CET 2022]

45. Find the number of hydrogen atoms present in 6.0 g of $H_2N-\overset{\overset{O}{\|}}{C}-NH_2$
a) 3.01×10^{23} b) 4.06×10^{23} c) 2.4×10^{23} d) 2.16×10^{23}

46. Mass of one molecule of oxygen in amu and in gram respectively is
a) 16 u, 6.0×10^{-24} g b) 32 u, 53.13×10^{-24} g
c) 53.13 u $\times 10^{-24}$ u, 32 g d) 42 u, 5.313×10^{-24} g

47. Which of the following species has highest mass ?
a) 10 mL water at room temperature b) $\frac{1}{2}$ mole of CH_4
c) 1 mole of carbon atoms d) 3.011×10^{23} atoms of oxygen

48. How many molecules of water are present in a drop of volume 0.05 mL ?
a) 6.00×10^{21} b) 1.67×10^{21} c) 2.0×10^{21} d) 5.02×10^{21}

49. How many moles of helium gas occupy 22.4 L at 0°C and at 1 atmospheric pressure ?
a) 0.11 b) 1.11 c) 1.0 d) 0.9

50. Identify the gas from the following so that 1 litre of it weighs 1.16 g at STP.
a) C_2H_2 b) CH_4 c) O_2 d) CO