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GOVERNMENT OF TAMILNADU HIGHER SECONDARY FIRST YEAR CHEMISTRY

Basic Concepts of Chemistry and Chemical Calculations

Unit

Choose the best answer.

- 1. 40 ml of methane is completely burnt using 80 ml of oxygen at room temperature The volume of gas left after cooling to room temperature is
 - (a) 40 ml CO₂ gas (b) 40 ml CO₂ gas and 80 ml H₂O gas

(c) 60 ml CO₂ gas and 60 ml H₂O gas (d) 120 ml CO₂ gas

- 2. An element X has the following isotopic composition ${}^{200}X = 90$ %, ${}^{199}X = 8$ % and ${}^{202}X = 2$ %. The weighted average atomic mass of the element X is closest to
 - (a) 201 u (b) 202 u
 - (c) 199 u (d) 200 u
- 3. Assertion : Two mole of glucose contains 12.044×10^{23} molecules of glucose

Reason : Total number of entities present in one mole of any substance is equal to 6.02×10^{22}

- (a) both assertion and reason are true and the reason is the 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) both assertion and reason are false
- 4. Carbon forms two oxides, namely carbon monoxide and carbon dioxide. The equivalent mass of which element remains constant?
 - (a) Carbon (b) oxygen

(c) both carbon and oxygen (d) neither carbon nor oxygen

- 5. The equivalent mass of a trivalent metal element is 9 g eq⁻¹ the molar mass of its anhydrous oxide is
 - (a) 102 g (b) 27 g (c) 270 g (d) 78 g

6. The number of water molecules in a drop of water weighing 0.018 g is

(a) 6.022×10^{26} (b) 6.022×10^{23}

(c) 6.022×10^{20} (d) 9.9×10^{22}

7. 1 g of an impure sample of magnesium carbonate (containing no thermally decomposable impurities) on complete thermal decomposition gave 0.44 g of carbon dioxide gas. The percentage of impurity in the sample is

(a) 0 % (b) 4.4 % (c) 16 % (d) 8.4 %

8. When 6.3 g of sodium bicarbonate is added to 30 g of acetic acid solution, the residual solution is found to weigh 33 g. The number of moles of carbon dioxide released in the reaction is

(a) 3 (b) 0.75 (c) 0.075 (d) 0.3

9. When 22.4 litres of H₂ (g) is mixed with 11.2 litres of Cl₂ (g), each at 273 K at 1 atm the moles of HCl (g), formed is equal to

(a) 2 moles of HCl (g)	(b) 0.5 moles of HCl (g)
(a) 2 moles of HCl (g)	(b) 0.5 moles of HCI (g)

- (c) 1.5 moles of HCl (g) (d) 1 moles of HCl (g)
- 10. Hot concentrated sulphuric acid is a moderately strong oxidising agent. Which of the following reactions does not show oxidising behaviour?

(a) $Cu + 2H_2SO_4$	\rightarrow	$CuSO_4 + SO_2 + 2H_2O$
(b) C+ 2H ₂ SO ₄	\rightarrow	CO ₂ +2SO ₂ +2H ₂ O
(c) $BaCl_2 + H_2SO_4$	\rightarrow	BaSO ₄ +2HCl

(d) none of the above

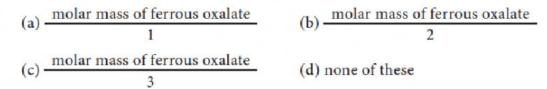
11. Choose the disproportionation reaction among the following redox reactions.

(a) $3Mg(s) + N_2(g)$	\rightarrow	$Mg_3N_2(s)$
(b) $P_4(s) + 3 \text{ NaOH} + 3H_2O$	\rightarrow	$PH_3(g) + 3NaH_2PO_2$ (aq)
(c) $\operatorname{Cl}_2(g) + 2\operatorname{KI}(aq)$	\rightarrow	2 KCl(aq) + I_2
(d) $Cr_2O_3(s) + 2Al(s)$	\rightarrow	$Al_2O_3(s) + 2Cr(s)$

12. The equivalent mass of potassium permanganate in alkaline medium is

 $MnO_4^- + 2H_2O + 3e^- \rightarrow MnO_2 + 4OH^-$

- (a) 31.6 (b) 52.7 (c) 79 (d) None of these
- 13. Which one of the following represents 180g of water?
 - (a) 5 Moles of water (b) 90 moles of water (c) $\frac{6.022 \times 10^{23}}{180}$ molecules of water (d) 6.022×10^{24} molecules of water
- 14. 7.5 g of a gas occupies a volume of 5.6 litres at 0° C and 1 atm pressure. The gas is
 (a) NO
 (b) N₂O
 (c) CO
 (d) CO₂
- 15. Total number of electrons present in 1.7 g of ammonia is
 - (a) 6.022×10^{23} (b) $\frac{6.022 \times 10^{22}}{1.7}$ (c) $\frac{6.022 \times 10^{24}}{1.7}$ (d) $\frac{6.022 \times 10^{23}}{1.7}$
- 16. The correct increasing order of the oxidation state of sulphur in the anions $SO_4^{2^-}$, $SO_3^{2^-}$, $S_2O_4^{2^-}$, $S_2O_6^{2^-}$ is (a) $SO_3^{2^-} < SO_4^{2^-} < S_2O_4^{2^-} < S_2O_6^{2^-}$ (b) $SO_4^{2^-} < S_2O_4^{2^-} < S_2O_6^{2^-} < SO_3^{2^-}$ (c) $S_2O_4^{2^-} < SO_3^{2^-} < S_2O_6^{2^-} < SO_4^{2^-}$ (d) $S_2O_6^{2^-} < SO_4^{2^-} < SO_4^{2^-} < SO_3^{2^-}$
- 17. The equivalent mass of ferrous oxalate is



- 18. If Avogadro number were changed from 6.022×10^{23} to 6.022×10^{20} , this would change
 - (a) the ratio of chemical species to each other in a balanced equation
 - (b) the ratio of elements to each other in a compound
 - (c) the definition of mass in units of grams
 - (d) the mass of one mole of carbon

- Two 22.4 litre containers A and B contains 8 g of O₂ and 8 g of SO₂ respectively at 273 K and 1 atm pressure, then
 - (a) Number of molecules in A and B are same
 - (b) Number of molecules in B is more than that in A.
 - (c) The ratio between the number of molecules in A to number of molecules in B is 2:1
 - (d) Number of molecules in B is three times greater than the number of molecules in A.
- 20. What is the mass of precipitate formed when 50 ml of 8.5 % solution of AgNO₃ is mixed with 100 ml of 1.865 % potassium chloride solution?

(a) 3.59 g (b) 7 g (c) 14 g (d) 28 g

21. The mass of a gas that occupies a volume of 612.5 ml at room temperature and pressure (25⁰ C and 1 atm pressure) is 1.1g. The molar mass of the gas is

(a) 66.25 g mol^{-1}	(b)	44 g mol ⁻¹	
(c) 24.5 g mol ⁻¹	d)	662.5 g mol ⁻¹	

22. Which of the following contain same number of carbon atoms as in 6 g of carbon-12.

(a) 7.5 g ethane	(b)	8 g methane	
(c) both (a) and (b)	(d)	none of these	

 Which of the following compound(s) has /have percentage of carbon same as that in ethylene (C₂H₄)

(a) propene		(b)	ethyne	

- (c) benzene (d) ethane
- 24. Which of the following is/are true with respect to carbon -12.
 - (a) relative atomic mass is 12 u
 - (b) oxidation number of carbon is +4 in all its compounds.
 - (c) 1 mole of carbon-12 contain 6.022×10^{22} carbon atoms.
 - (d) all of these
- 25. Which one of the following is used as a standard for atomic mass.
 - (a) ${}_{6}C^{12}$ (b) ${}_{7}C^{12}$ (c) ${}_{6}C^{13}$ (d) ${}_{6}C^{14}$