

# Viva Questions with Answers on Quantitative Estimation (Volumetric Analysis)

## 1. Why should weights not be lifted with hand ?

**Ans.** This causes error in the weighing because some matter may be transferred from the hand to the weight.

## 2. Why is front door of the balance closed during weighing ?

**Ans.** Opening the front door causes vibrations in the pan due to operator's breath or air currents which leads to inaccurate results.

## 3. What is the maximum weight that can be weighed in a chemical balance ?

**Ans.** 100 grams.

## 4. What is the weight of a rider ?

**Ans.** 10 mg.

## 5. What is the use of a rider ?

**Ans.** A rider is used for weights less than 10 mg.

## 6. What is the principle of volumetric analysis ?

**Ans.** In volumetric analysis, the concentration of a solution is determined by allowing a known volume of this to react quantitatively with another solution of known concentration.

## 7. What is titration ?

**Ans.** The process of adding one solution from the burette to another in the titration flask in order to complete the chemical reaction involved, is known as titration.

**8. What is indicator ?**

**Ans.** Indicator is a chemical substance which changes colour at the end point.

**9. What is end point ?**

**Ans.** The stage during titration at which the reaction is just complete is known as the end point of titration.

**10. Why a titration flask should not be rinsed ?**

**Ans.** This is because during rinsing some liquid will remain sticking to the titration flask therefore the pipetted volume taken in the titration flask will increase.

**11. What are primary and secondary standard substances ?**

**Ans.** A substance is known as primary standard if it is- available in high degree of purity, if it is stable and unaffected by air, if it does not gain or lose moisture in air, if it is readily soluble and its solution in water remains as such for long time. On the other hand, a substance which does not possess the above characteristics is called a secondary standard substance. Primary standards are crystalline oxalic acid, anhydrous  $\text{Na}_2\text{CO}_3$ , Mohr's salt, etc.

**12. Burette and pipette must be rinsed with the solution with which they are filled, why ?**

**Ans.** The burette and pipette are rinsed with the solution with which they are filled in order to remove any substance sticking to their sides, which otherwise would decrease the volume of the liquids to be taken in them.

**13. It is customary to read lower meniscus in case of colourless and transparent solutions and upper meniscus in case of highly coloured solutions, why ?**

**Ans.** Because it is easy to read the lower meniscus in case of colourless solutions, while the upper meniscus in case of coloured solutions.

**14. What is a normal solution ?**

**Ans.** A normal solution is a solution, a litre of which contains one gm-equivalent of the solute. This is symbolised as 1 N.

**15. Why the last drop of solution must not be blown out of a pipette ?**

**Ans.** Since the drops left in the jet end is extra of the volume measured by the pipette.

**16. Pipette should never be held from its bulb, why ?**

**Ans.** The heat of our body may expand the glass bulb and introduce an error in the measurement of the volume.

**17. What is acidimetry and alkalimetry ?**

**Ans.** It is the branch of volumetric analysis involving chemical reaction between an acid and a base.

**18. What do you mean by 1.0 M solution ?**

**Ans.** A solution containing 1 mole of solute per litre of solution is 1.0 M solution.

**19. What is meant by the term 'concordant readings' ?**

**Ans.** The readings in volumetric analysis which differ by less than 0.05 mL are known as concordant readings.

**20. Can one take oxalic acid solution in the burette and sodium hydroxide solution in the titration flask ? What are the limitations of doing so if any ?**

**Ans.** No, because when sodium hydroxide solution is taken in the titration flask, the colour change at the end point would be pink to colourless. The accuracy in noting this change may be less as compared to change from colourless to pink.

**21. Which indicator is used in the titration of sodium carbonate against hydrochloric acid and what is the colour change at the end point ?**

**Ans.** Methyl orange. The colour change is yellow to pinkish red.

**22. What is the difference between an end point and an equivalence point ?**

**Ans.** End point is the point at which the indicator shows a visible change indicating that the reaction has completed. Equivalence point is the point at which stoichiometric amounts of the two reactants have been added. Visible end point may or may not exactly coincide with equivalence point.

**23. What indicator is used in the titration of oxalic acid with sodium hydroxide ? Which solution is taken in the burette and what is the end point ?**

**Ans.** Phenolphthalein. Sodium hydroxide solution is taken in the burette. Appearance of pink colour is the end point.

**24. What is the indicator used in the titration of sodium carbonate against hydrochloric acid ? Which solution is taken in the burette and what is the end point ?**

**Ans.** Methyl orange. Acid solution is taken in the burette, change of colour from yellow to pink is the end point.

**25. What is basicity of an acid ?**

**Ans.** It is the number of replaceable hydrogen atoms in a molecule of the acid.

**26. What is the relation between equivalent mass of acid and its molecular mass ?**

**Ans.**

$$\text{Equivalent mass of acid} = \frac{\text{Molecular mass}}{\text{Basicity}}$$

**27. What is acidity of a base ?**

**Ans.** It is the number of  $\text{OH}^-$  ions furnished by a molecule of the base.

**28. What is the relation between equivalent mass of a base and its molecular mass ?**

**Ans.**

$$\text{Equivalent mass of base} = \frac{\text{Molecular mass}}{\text{Acidity}}$$