Chapter One

General Questions

Q 1 What is normality?

Ans It is the number of gram equivalents of the substance dissolved per litre of the solution.

Q 2 How would you prepare *x* N solution of a substance?

Ans *x* N solution is prepared by dissolving *x* gram equivalent weight of the active substance in solvent/water and then the volume is made upto 1000 ml by adding the solvent/water.

Q 3 What is molarity?

Ans It is the number of gram moles of the substance dissolved per litre of solution.

Q 4 How would you prepare *x* M solution?

Ans *x* M solution is prepared by dissolving *x* gram-molecule of the reagent in solvent/water and then the volume is made upto 1000 ml by further addition of solvent/water.

Q 5 What is fuming chamber/fume cupboard? State its use.

Ans Fuming chamber is an enclosed chamber fitted with exhaust fan and an outlet in the open air. Fuming chamber is used to remove the hazardous fumes produced in chemical reactions which otherwise would harm the people working in the laboratory.

Q 6 Give the concentration of concentrated sulphuric acid used in the laboratory.

Ans Concentrated sulphuric acid should contain not less than 97.00% w/w of H_2SO_4. The approximate normality of concentrated sulphuric acid is 36 N or 18 M.

Q 7 Give the concentration of concentrated hydrochloric acid used in the laboratory.

Ans Concentrated hydrochloric acid should contain 35–38% w/w of HCl. The approximate normality of concentrated hydrochloric acid is 11.5 N.

Q 8 Give the concentration of concentrated nitric acid used in the laboratory.

Ans Concentrated nitric acid should contain 69.0–71.0% w/w of HNO_3. The approximate normality of concentrated nitric acid is 16 N.

Q 9 Give the concentration of glacial acetic acid used in the laboratory.

Ans Glacial acetic acid should contain not less than 99.0% w/w $C_2H_4O_2$. The approximate normality of glacial acetic acid is 17.5 N.

Q 10 What is the difference between glacial acetic acid and acetic acid?

Ans Glacial acetic acid contains not less than 99.0% w/w of CH_3COOH. The approximate normality is about 17.5 N.

Acetic acid contains approximately 33% w/w of CH_3COOH. Dilute 315 ml of glacial acetic acid to 1000 ml with water to get acetic acid.

Q 11 Give the concentration of dilute hydrochloric acid. How is it prepared?

Ans Dilute hydrochloric acid contains about 10% w/w of HCl. Mix 274 g of hydrochloric acid with 726 g of purified water.

Q 12 Give the concentration of dilute nitric acid. How is it prepared?

Ans Dilute nitric acid contains approximately 10% w/w of HNO_3. Dilute 106 ml of nitric acid to 1000 ml with water to get dilute nitric acid.

Q 13 Give the concentration of dilute sulphuric acid. How is it prepared?

Ans Dilute sulphuric acid contains approximately 10% w/w of sulphuric acid. Dilute 57 ml of sulphuric acid to 1000 ml with water to produce dilute sulphuric acid. The calculated amount of water is taken and slowly, with stirring and cooling the calculated amount of concentrated acid is added to it.

Q 14 Give concentration of dilute acetic acid.

Ans Dilute acetic acid contains approximately 6% w/w of CH_3COOH. Dilute 57 ml of glacial acetic acid to 1000 ml.

Q 15 Give the concentration of strong ammonia solution.

Ans Strong ammonia solution contains 25% w/w of ammonia. The strength is about 13.5 M.

Q 16 Give the concentration of dilute ammonia solution.

Ans Dilute ammonia solution contains approximately 10% w/w of NH_3, i.e. ammonia. Dilute 425 ml of strong ammonia solution to 1000 ml to get dilute ammonia solution.

Q 17 What is soda-lime chemically? What is its use?

Ans It is a mixture of sodium hydroxide, or sodium hydroxide and potassium hydroxide, with calcium hydroxide. It is used to absorb carbon dioxide. It absorbs about 20% of its weight of carbon dioxide.

Q 18 What is analytical reagent grade chemical?

Ans Analytical reagent implies that the chemical is of a high degree of purity wherein the limits of various

impurities are known and are below the limits stated in Indian Pharmacopoeia.

Q 19 What is laboratory reagent grade chemical?

Ans Laboratory reagent grade implies that it is chemically pure grade material, which is not necessarily required to be tested for limiting or absence of certain impurities. The purity is less than AR grade chemicals.

Q 20 What is fuming nitric acid?

Ans Fuming nitric acid contains about 95% w/w of HNO_3. It is a fuming liquid.

Q 21 How *x* M sulphuric acid is prepared?

Ans Solution of x M molarity is prepared by carefully adding 54 x ml of sulphuric acid to an equal volume of water and diluting to 1000 ml with water.

Q 22 How *x* N sulphuric acid is prepared?

Ans x N sulphuric acid is prepared by diluting 27 x ml of sulphuric acid to 1000 ml with water.

Q 23 How *x* M hydrochloric acid is prepared?

Ans Solutions of x M hydrochloric acid is prepared by diluting 85 x ml hydrochloric acid to 1000 ml with water.

Q 24 How *x* N hydrochloric acid is prepared?

Ans x N hydrochloric acid is same as x M HCl and is prepared by diluting 85 x ml of hydrochloric acid to 1000 ml with water.

Q 25 How *x* M HNO_3 is prepared?

Ans x M HNO_3 is prepared by diluting 63 x ml of nitric acid to 1000 ml with water.

Q 26 How *x* N HNO_3 is prepared?

Ans x N HNO_3 is same as x M HNO_3 and is prepared by diluting 63 x ml of nitric acid to 1000 ml with water.