Q. 1. What do you observe when : barium chloride solution is added to a dilute sulphuric acid.

Q. 2. Give equation for the following conversions

i. sulphur dioxide to sulphur
ii. sulphur dioxide to sodium sulphite
iii. sodium sulphite to sulphur dioxide.

Q. 3. Give one similarity and two differences between bleaching action of SO_2 gas and chlorine gas.

Q. 4. Write the equation for the laboratory preparation of sulphur dioxide from sodium sulphite. [ii] How is the SO_2 collected ? [iii] What does the method of collection tell you about the density of SO_2 ? [iv] What do you see when SO_2 is bubbled through an acidified $K_2Cr_2O_7$ solution ?

Q. 5. Write one equation in each case to show the action of sulphur dioxide as :

i. a reducing agent;
ii. an oxidizing agent;
iii. an acid anhydride.

Q. 6. What is the similarity in the use of sulphur dioxide and chlorine as bleaching agents.

Q. 7. Write correctly balanced equation for the following reaction – Iron and dilute sulphuric acid.

Q. 8. Name the oxide of sulphur which reacts with water to give sulphuric acid.

Q. 9. In the Contact Process, the direct reaction between oxide of sulphur and water is avoided. In this process, What does the oxide of sulphur react with instead of water and what is the name of the product ?

Q. 10. Write correctly balanced equation for the reaction of dilute sulphuric acid with each of the following :

i. Copper carbonate
ii. Lead nitrate solution
iii. Zinc hydroxide

Q. 11. Supply the word [or words] that will make the sentence into a correct statement and rewrite the sentence.

[i] Copper sulphate crystals are dehydrated by sulphuric acid.

Q. 12. Write a balanced equation for the reaction between zinc and dilute sulphuric acid.

Q. 13. When burning sulphur [i.e. SO_2] reacts with H_2O , a compound is formed. Name the compound.

Q. 14. Give the balanced equation for reaction between SO_2 and moist Cl_2.

Q. 15. What is the purpose of the Contact Process. Name the catalyst used in the Contact Process. Write the balanced equation for the reaction in the process which takes place in the presence of the catalyst.

Q. 16. When H_2S reacts with oxidizing agents, what substances is always a product of the reaction.

Q. 17. State the colour of the precipitate formed when H_2S is bubbled through copper sulphate solution.

Q. 18. What do you see when concentrated sulphuric acid is added to copper sulphate-5-water.

Q. 19. Write a balanced equation for : SO_2 and sodium hydroxide soln. [formation of normal salt].

Q. 20. State how you can obtain : H_2S from iron (II) sulphide.

Q.21. Name one catalyst used industrially which speeds up the conversion of SO_2 to SO_3 in the production of sulphuric acid in the laboratory or industrially. Write the equation for the conversion of sulphur dioxide to sulphur trioxide. Why does this reaction supply energy. What is the name of the compound formed between SO_3 and sulphuric acid.

Q. 22. Write the balanced equations for dilute HCl and sodium sulphite.

Q. 23. Write equations for :- [i] Dil H_2SO_4 – producing H_2, [ii] Between $Pb(NO_3)2$ soln. & dil. H_2SO_4.

Q. 24. Explain a reagent chosen from :- ammonium hydroxide, barium chloride, sodium hydroxide, sulphuric acid and nitric acid enable to distinguish between the two acids mentioned therein.

Q. 25. From the following gases :- ammonia, chlorine, hydrogen chloride, sulphur dioxide, select the gas that matches the description given below and answer the questions that follow : Gas A is a reducing agent which contains oxygen. [i] What is the name of gas A ? [ii] What would you observe if gas A is bubbled through acidified potassium dichromate solution.

Q. 26. State the substance/s reacted with dilute or concentrated sulphuric acid to form the following gases : [i] Hydrogen [ii] Carbon dioxide. State whether the acid used in each case is dilute or concentrated.

Q. 27. Write the equations for the laboratory preparation of : [i] Sodium sulphate using dilute sulphuric acid. [ii] Lead sulphate using dilute sulphuric acid.

Q. 28. Name a gas which smells of rotten eggs.

Q.29. Write the observations and balanced equations for the reaction : A paper dipped in potassium permanganate solution is put on the mouth of a test-tube containing sulphur dioxide gas.

Q. 30 State the name of the process by which H_2SO_4 is manufactured. Name the catalyst used.

Q. 31. "Concentrated sulphuric acid is used in the laboratory preparation of nitric acid and hydrochloric acid because it is _____ [less volatile/stronger] in comparison to these two acids."

Q. 32. Write the equations for the laboratory preparation of the following salts using sulphuric acid :

i. Copper sulphate from copper
ii. Lead sulphate from lead nitrate.

Q. 33. From the gases ammonia, hydrogen chloride, hydrogen sulphide, sulphur dioxide – Select the following :

i. This gas can be oxidized to sulphur.
ii. This gas decolourises potassium permanganate solution.
iii. This gas can be obtained by the reaction between copper and concentrated sulphuric acid.

Q. 34. Name the catalyst which helps in the conversion of sulphur dioxide to sulphur trioxide.

Q. 35. In the Contact process for the manufacture of sulphuric acid, sulphur trioxide is not converted to sulphuric acid by reacting it with water. Instead a two-step procedure is used. Write the equations for the two steps involved.

Q. 36. What type of substance will liberate sulphur dioxide from sodium sulphite.

Q. 37. Write the equation for the reaction by which sulphur dioxide is converted to sodium sulphite.

Q. 38. The bleaching action of Cl_2 is permanent whereas the bleaching action of SO_2 is temporary.

i. Give the reason why chlorine is not used to bleach silk.
ii. State the similarity in the use of sulphur dioxide and chlorine as bleaching agents.
iii. Explain the bleaching action of sulphur dioxide with the help of chemical equation.

iv Why is bleaching by sulphur dioxide only temporary.

Q. 39. Write balanced equations for the following reactions :

i. Potassium hydrogen carbonate and dilute sulphuric acid.
ii. Sodium nitrate and concentrated sulphuric acid.

Q. 40. Choose the properties of sulphuric acid (A, B, C and D), which is relevant to each of the preparations [i] to [iii] :-

A : Dil. acid (typical acid properties), B : Non-volatile acid, C : Oxidising agent, D : Dehydrating agent

i. Preparation of hydrogen chloride.
ii. Preparation of ethane from ethanol.
iii. Preparation of copper sulphate from copper oxide.

Q. 41. What is observed when hydrogen sulphide gas is passed through lead acetate solution.

Q. 42. Select the correct compound from the list given – Ammonia, Copper oxide, Copper sulphate, Hydrogen chloride, Hydrogen sulphide, Lead bromide – which matches the description given below : This compound smells of rotten eggs.

Q. 43. State what is observed when sulphur dioxide is passed through a jar containing bromine water.

Q. 44. Name the process used for the large scale manufacture of sulphuric acid.

Q. 45. Which property of sulphuric acid accounts for its use as a dehydrating agent.

Q. 46. Concentrated sulphuric acid is both an oxidizing agent and a non-volatile acid. Write one equation each to illustrate the above mentioned properties of sulphuric acid.

Q. 47. Give a reason why sulphur dioxide is used as an antichlor.

Q. 48. Write balanced equation for the following reactions :

i. Lead sulphate from lead nitrate solution and dilute sulphuric acid.
ii. Copper sulphate from copper and concentrated sulphuric acid.
iii. Ammonium sulphate from ammonia and dilute sulphuric acid.

Q. 49. Some properties of Sulphuric acid are listed below. Choose the property A, B, C or D which is responsible for the reactions (i) to (v). Some properties may be repeated :

A. Acid; B. Dehydrating agent; C. Non-volatile acid; D. Oxidizing agent.

i. $C12H22O11 + nH_2SO_4 \rightarrow 12C + 11H_2O + nH_2SO_4$
ii. $S + 2H_2SO_4 \rightarrow 3SO_2 + 2H_2O$
iii. $NaCl + H_2SO_4 \rightarrow NaHSO_4 + HCl$
iv. $CuO + H_2SO_4 \rightarrow CuSO_4 + H_2O$
v. $Na_2CO_3 + H_2SO_4 \rightarrow Na_2SO_4 + H_2O + CO_2$

Q. 50. i Name the acid formed when sulphur dioxide dissolves in water.

ii Name the gas released when sodium carbonate is added to a solution of sulphur dioxide.
iii What are the two necessary conditions for the direct combination of sulphur dioxide and chlorine forming sulphuryl chloride ?
iv State the property of sulphur dioxide which causes potassium permanganate to change its colour from purple to colourless.

Q. 51. HCl, HNO_3 and H_2SO_4 are the formulae of three compounds. Which of these compounds has the highest boiling point and which has the lowest?

Q. 52. Dilute hydrochloric acid and dilute sulphuric acid are both colourless solutions. How will the addition of barium chloride solution to each help to distinguish between the two