

- (c)  $\text{SO}_2$  (d) NO
193. A single chloride free radical can destroy how many ozone molecules? (6 Time)
- (a) 100 (b) 100,000 (c) 100,00 (d) 10
194. Peroxyacetyl nitrate (PAN) is an irritant to human beings and it affects.
- (a) Eyes (b) Ears (c) Stomach (d) Nose
195. The main pollutant of leather tanneries in the waste water is:
- (a) Lead (b) Chromium (VI)  
(c) Copper (d) Chromium (III)
196. In purification of portable water the coagulant used is:
- (a) Nickel sulphate (b) Copper Sulphate  
(c) Barium Sulphate (d) Aluminum Sulphate(Alum)
197. The newspaper can be recycled again and again many times as:
- (a) 5 (b) 3 (c) 4 (d) 2

## (SUBJECTIVE PART)

# 68/68 Marks Challenge

### SECTION-I

#### SHORT QUESTIONS (SQs)

1. Write four uses of Borax?
2. What is chemistry of Borax bead test?
3. How borax can be converted to orthoboric acid?
4. Why aqueous solution of Borax is alkaline in nature?
5. How Borax is used as water softening agents?
6. How does orthoboric acid react with:
  - a. (i) Ethyl Alcohol (ii) NaOH
7. Give the formulas of four boric acids with names.
8. What is action of heat on orthoboric acid,  $\text{H}_3\text{BO}_3$ ?
9. What are uses of Boric acid?
10. How aluminum reacts with aqueous sodium hydroxide?
11. Give any four uses of Aluminum.
12. Why is  $\text{CO}_2$  a gas at room temperature? While  $\text{SiO}_2$  is a solid?
13. What is vitreous silica?
14. Write four uses of sodium silicate?
15. What is meant by chemical garden?
16. What are Silicates?
17. What are silicones? Write their two uses?
18. Write the names of four oxides of lead used as pigments.

19. What are monocyclic and polycyclic aromatic hydrocarbons?
20. What objections were raised on the Kekule's structure for benzene molecule?
21. What are the main points given by Kekule for structure of benzene?
22. Describe X-ray structure of Benzene.
23. Describe the structure of Benzene on the basis of Resonance.
24. Define Resonance Energy. Give resonance energy of Benzene.
25. What is Wurtz-Fittig reaction?
26. Benzene can be prepared commercially from acetylene. Give reaction with conditions.
27. How Hexane and Heptane can give Benzene and Toluene respectively.
28. What does happen to benzene during Friedel Craft's reaction? Give mechanism of one reaction.
29. Give two addition reactions of benzene.
30. Prepare m-chloronitro benzene from benzene in two steps.
31. Explain the term oxidation with one example using benzene.
32. Write name of any four ortho-para directing groups?
33. Why hydroxyl group (-OH) is ortho and para directing group?
34. Benzene is less reactive than Alkene, why?
35. Differentiate between thermoplastic and thermosetting polymers.
36. What is condensation polymerization? Give two examples? Write a note on condensation polymer.
37. How Nylon -6, 6 can be obtained?
38. How PVC is prepared? Give its uses.
39. Write major uses of epoxy resin?
40. What are epoxy resins? How are they prepared?
41. What are carbohydrates and how are they classified?
42. What is the difference between Glucose and Fructose?
43. Define Proteins and write names of elements present in them?
44. What is difference between conjugated protein and derived protein?
45. What are lipids? Give their types.
46. What are the characteristics of Lipids?
47. Give two differences between oils and fats?
48. Define saponification and hardening of oil.
49. Define Saponification number and iodine number?
50. What is rancidity of fats? Why it occurs?
51. Write a note on Cholesterol?
52. Describe briefly the importance of Lipids?
53. Give two remarkable properties of enzymes?
54. Give four properties of enzymes.

55. Write the factors which affect the enzyme activity?
56. Write down the names of two enzymes used in the diagnosis of disease.
57. Name four components of environment?
58. What is Ecosystem?
59. What are primary and secondary pollutants? Give example of each.
60. What is the major health effect of Pollutant of CO?
61. What is chemical oxygen demand (COD)? How it is measured?
62. How CO (Carbon monoxide) is a poisonous gas?
63. What is acid rain?
64. What is Photochemical smog? Give its properties?
65. What are conditions for the formation of smog?
66. How chloroflorocarbons (CFCs) destroy the Ozone layer?
67. What is smog? What are the contents of photochemical smog?
68. Discuss detergents as water pollutants?
69. Leather tanneries pollute water. Explain.
70. Explain the term BOD?
71. Write harmful effects of chlorination of water?
72. What are the effects of dumping of waste in sea and rivers?
73. What are Leachate and what they contain?
74. What is the purpose of the process of incineration?
75. What is recycling of raw materials?
76. How recycling of plastic is done by the process of transformation?

## SECTION-II

### SHORT QUESTIONS (SQs)

1. How does nitrogen differ from other members of its group?
2. Justify that  $N_2O$  is a supporter of combustion.
3. Write ring test for the confirmation of nitrates.
4. How does NO act as oxidizing agent?
5. Give reaction of  $NO_2$  with  $H_2S$  and KI.
6. What is Aqua Regia? How does it dissolve gold?
7. Give reactions of CU with di  $HNO_3$  and conc.  $HNO_3$ ?
8. Write four uses of  $HNO_3$ .
9. How does  $HNO_2$  acts as reducing agents?
10. Give definition of allotropy. Write allotropes of phosphorus?

11. Write the properties of white phosphorus?
12.  $P_2O_5$  is a powerful dehydrating agent, prove by giving two examples?
13. What is action of heat on ortho phosphoric acid?
14. Why the elements of Group IV-A other than oxygen show more than two oxidation states?
15. Justify  $H_2SO_4$  is a king of chemicals?
16. Why  $SO_3$  gas is dissolved in  $H_2SO_4$  but not in water in contact process?
17. Write two reactions in which  $H_2SO_4$  acts as dehydrating agents?
18. Why vital force theory was rejected?
19. Define catenation.
20. What is destructive distillation?
21. What is natural gas? Write its two uses.
22. Differentiate between catalytic and steam cracking?
23. Write importance of cracking.
24. What is octane number? How octane number is improved?
25. Define aromatic compounds, Give an example.
26. Differentiate between homocyclic or heterocyclic compounds.
27. What are alicyclic compounds? Give two examples.
28. What are homocyclic compounds? Give two examples.
29. Define functional group. Give two examples of oxygen containing functional group?
30. Define functional group isomerism and of give an example.
31. Define metamerism with example.
32. Define Tautomerism by giving one example.
33. Why does Alkane show least-reactivity?
34. Alkanes are less reactive than Alkenes, comment.
35. Give four uses of methane?
36. What is heat of combustion?
37. What are Clemmensen and Wolf-Kishner reduction reactions? How they differ?
38. What is Raney-Nickel? Where it is used?
39. Define Markovnikov's Rule and give one example.
40. Give the mechanism of  $O_3$  ozonolysis of Ethene?
41. What is Baeyer's test?
42. Prepare Cis and Trans alkenes from Alkyne along with chemical equation.
43. Give four uses of ethene?
44. How will you prepare the following compounds from ethene?
45. How Ethyne is converted to:
  - a. (a) Acetaldehyde
  - (b) Benzene

46. How primary, secondary and tertiary alcohols are different from each other in structure.
47. Give an excellent method for the preparation of simple alkyl iodides?
48. Why "R-X" is reactive compound?
49. Why the reactivity of alkyl halide depends upon bond energy?
50. Give mechanism of  $S_N1$  reactions.
51. Give only mechanism for  $S_N2$  reactions.
52. What is leaving group and substrate?
53. What are electrophile and Nucleophile?
54. Convert ethyl bromide into:
- |    |      |               |     |         |
|----|------|---------------|-----|---------|
| a. | i.   | n-butane      | ii. | Ethene  |
| b. | iii. | Ethyl alcohol | iv. | Propane |
55. What are elimination reactions? Give examples of  $E_1$  and  $E_2$ .
56. Starting from ethyl bromide ( $C_2H_5Br$ ), how will you prepare ethane and ethene.
57. What is Wurtz synthesis?
58. Why dry ether is necessary for preparation of Grignard reagent?
59. What is Grignard's reagent? How is prepared?
60. Convert ethyl magnesium bromide into 1-butanol.
61. What are fertilizers? Why are they needed?
62. What are micro-nutrients and macronutrients?
63. Write any four points of essential qualities of a good fertilizer?
64. Why nitrogen is necessary for plants? Give names of two nitrogen fertilizers
65. Why Ammonium Nitrate is not added to the crop of Paddyrice?
66. What are Phosphatic fertilizers? Give two formulas of Phosphatic fertilizers?
67. Write average composition of cement.
68. Why wet process is preferable over dry process in preparation of cement?
69. Just write five-stages involved in the manufacturing of Portland cement.
70. Explain reactions taking place in first 24-hours during setting of cement.
71. Discuss reaction taking place in 1-7 days in setting of cement.
72. What is meant by setting of cement?
73. Write names of four non-woody raw materials for the production of paper and pulp.

### **SECTION-III**

#### **SHORT QUESTIONS (SQs)**

1. Why d-and f-block elements are called transition elements?
2. What are interstitial compounds?

3. Why transition elements have variable oxidation state?
4. How do transition elements display colour?
5. Write two/four properties of transition metals?
6. What is meant by coordination sphere? Give one example?
7. What do you mean by coordination number?
8. Define coordination ligand. Give one example.
9. What are Chelates? Give an example
10. What is ligand? Give types of Ligand.s
11. Define coordination ligand. Give one example.
12. Write down the chemical formulas of:
  - a. i. Magnetite
  - ii. Haematite
13. What are the commercial forms of iron. What percentage of carbon is present in each.
14. Define corrosion.
15. Under What conditions aluminum get corrodes?
16. Write down the name of any four methods for prevention of corrosion.
17. Why does damaged tin plated iron get rusted quickly?
18. What is meant by sacrificial corrosion?
19. What is chromyl chloride test?
20. Write the uses of  $K_2Cr_2O_7$
21. Give any two uses of  $KMnO_4$ ?
22. Differentiate between primary and secondary alcohols.
23. How will you distinguish between 1-propanol and 2-propanol?
24. Give the structural formulae of:
  - a. i. Lactic Acid
  - ii. Tartaric Acid
25. How alcohol is denatured?
26. Define fermentation, give its conditions.
27. Why absolute alcohol is not obtained by fermentation process and how is it obtained?
28. Ethyl alcohol is a liquid while methyl chloride is a gas. Give reason.
29. What is Lucas test?
  - a. Write two uses each for methanol and ethanol.
30. Write down the formulas of:
  - a. i. Picric Acid
  - ii. P-hydroxybenzyl alcohol
31. How does picric acid synthesis take place?
32. Give the reactions of phenol with conc.  $H_2SO_4$  and acetyl chloride.
33. What is Williamson's synthesis of ether?
34. What is difference between Aldehyde and Keton.

- a. Give the formulas of: i. Formaldehyde ii. Acetaldehyde
35. What is Formalin?
36. Prepare acetone from calcium acetate.
37. Give Industrial preparation of Formaldehyde.
38. How acetaldehyde is prepared in industry?
39. How will you distinguish between ethanol and Benzaldehyde? Give respective chemical reaction.
40. What is "Haloforn Reaction" Give its uses.
41. Give reactions of Aldehyde with:
- a. i. HCN ii.  $\text{CH}_3\text{-CH}_2\text{-OH}$
42. What is Cannizzaro's reaction? Write one example.
43. How iodoform is prepared from acetaldehyde and ethyl alcohol?
44. How HCHO and  $\text{CH}_3\text{CHO}$  are polymerized? Give chemical reaction?
45. Write composition of Tollen's reagent? and which organic compound are usually identified by it?
46. What is "Fehling's solution test" of aldehyde?
47. Benedict's solution reacts with Aldehydes to give red-ppt. Justify it?
48. Write down four uses of formaldehyde?
49. Write four important uses of acetaldehyde?
50. Write formulae of Malonic acid and Phthalic acid.
51. What are fatty acids? Give an example.
52. Write the mechanism of Amide formation.
53. How acetic acid is obtained from methyl cyanide?
54. What is glacial acetic acid?
- a. Write any four uses of acetic acid.
55. What are amino acids? Give two examples.
56. What are essential and Non-essential amino acids?
57. What is Zwitter ion? How it is formed?
58. Explain acidic and basic behavior of Amino acids?
59. How amino acid is synthesized give one method.
60. What is Ninhydrin Test?
61. What is peptide bond? Write down formula of a dipeptide?

## LONG QUESTIONS

### LONG QUESTION NO. 5

- |   |   |
|---|---|
| ✓ What is Mendeleev's periodic table? Discuss improvements in Mendeleev's periodic table. | ✓ Explain peculiar behavior of Beryllium.<br>✓ Describe the process for the preparation of sodium metal on industrial scale by Down's |
|---|---|