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SET 4 – Redox Reactions

1. Redox reactions play a vital role in –
   a) Photosynthesis
   b) Respiration
   c) Corrosion
   d) All of these

2. Which process involves oxidation?
   a) Rusting of iron
   b) Respiration
   c) Burning of fuel
   d) All of these

3. Photosynthesis is an example of –
   a) Oxidation reaction
   b) Reduction reaction
   c) Redox reaction
   d) Neutralisation

4. In respiration, glucose is –
   a) Oxidised
   b) Reduced
   c) Hydrolysed
   d) None

5. The chemical formula for rust is –
   a) FeO
   b) $Fe_2O_3 \cdot xH_2O$
   c) $Fe(OH)_3$
   d) FeO(OH)

6. Corrosion of iron involves –
   a) Only oxidation
   b) Only reduction
   c) Both oxidation and reduction
   d) None

7. In rusting, the anodic reaction is –
   a) $Fe \rightarrow Fe^{2+} + 2e^-$
   b) $Fe^{2+} \rightarrow Fe^{3+} + e^-$
   c) $O_2 + 4H^+ + 4e^- \rightarrow 2H_2O$
   d) $2H^+ + 2e^- \rightarrow H_2$

8. In rusting, the cathodic reaction is –
   a) $Fe \rightarrow Fe^{2+} + 2e^-$

b) $O_2 + 4H^+ + 4e^- \rightarrow 2H_2O$
c) $Fe^{2+} \rightarrow Fe^{3+} + e^-$
d) None

9. Corrosion can be prevented by –
a) Painting
b) Galvanisation
c) Electroplating
d) All of these

10. Galvanisation is coating of iron with –
a) Zinc
b) Copper
c) Silver
d) Tin

11. Sacrificial protection of iron is achieved by using –
a) More electropositive metal
b) Less electropositive metal
c) Same metal
d) Non-metal

12. Which metal is used for sacrificial protection?
a) Zn
b) Cu
c) Ag
d) Au

13. Electrochemical corrosion involves –
a) Redox reaction
b) Acid-base reaction
c) Precipitation
d) Neutralisation

14. Which process is not a redox reaction?
a) Respiration
b) Rusting
c) Melting of ice
d) Photosynthesis

15. In the reaction $H_2S + Br_2 \rightarrow 2HBr + S$,
oxidising agent is –
a) H_2S
b) Br_2
c) HBr
d) S

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16. In the same reaction, reducing agent is –
    a) Br_2
    b) H_2S
    c) S
    d) HBr

17. Which of the following involves oxidation of nitrogen?
    a) $NH_3 \rightarrow NO$
    b) $NO_2 \rightarrow N_2$
    c) $NH_3 \rightarrow N_2$
    d) None

18. In reaction $SO_2 + 2H_2S \rightarrow 3S + 2H_2O$,
    oxidising agent is –
    a) SO_2
    b) H_2S
    c) S
    d) H_2O

19. Reducing agent in above reaction is –
    a) SO_2
    b) H_2S
    c) S
    d) H_2O

20. In bleach solution, active oxidising species is –
    a) Cl_2
    b) ClO^-
    c) ClO_3^-
    d) Cl_2O_7

21. Which process involves reduction of carbon?
    a) $C + O_2 \rightarrow CO_2$
    b) $CO_2 + C \rightarrow 2CO$
    c) $2CO \rightarrow CO_2 + C$
    d) $C + H_2O \rightarrow CO + H_2$

22. Which of the following reactions is oxidation?
    a) $C_2H_5OH \rightarrow CH_3CHO$
    b) $CH_3CHO \rightarrow C_2H_5OH$
    c) $CH_4 \rightarrow CH_3Cl$
    d) $C_2H_2 \rightarrow C_2H_4$

23. Which of the following is reduction?
    a) $CuO + H_2 \rightarrow Cu + H_2O$
    b) $2Mg + O_2 \rightarrow 2MgO$
    c) $4Fe + 3O_2 \rightarrow 2Fe_2O_3$

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d) $H_2S + Br_2 \rightarrow 2HBr + S$

24. In bleaching powder, oxidation state of Cl is –
    a) 0
    b) +1
    c) +3
    d) +5

25. The bleaching action of chlorine is due to –
    a) Oxidation
    b) Reduction
    c) Hydrolysis
    d) Adsorption

26. When Cl_2 reacts with cold NaOH, products are –
    a) NaCl and NaOCl
    b) NaCl and $NaClO_3$
    c) NaClO and $NaClO_3$
    d) NaCl and Na_2O

27. When Cl_2 reacts with hot NaOH, products are –
    a) NaCl and NaOCl
    b) NaCl and $NaClO_3$
    c) NaClO and $NaClO_3$
    d) Na_2O and HCl

28. The reaction $Cl_2 + 2NaOH$ (cold) $\rightarrow NaCl + NaOCl + H_2O$ is –
    a) Disproportionation
    b) Combination
    c) Decomposition
    d) None

29. In above reaction, oxidation number of Cl changes from –
    a) 0 to +1 and –1
    b) 0 to +3
    c) +1 to +5
    d) +5 to +7

30. The reaction $3Cl_2 + 6NaOH$ (hot) $\rightarrow 5NaCl + NaClO_3 + 3H_2O$ is –
    a) Disproportionation
    b) Combination
    c) Precipitation
    d) None

31. Oxidation number of chlorine in $NaClO_3$ is –
    a) +1
    b) +3

c) +5
d) +7

32. In photosynthesis, carbon dioxide is –
a) Oxidised
b) Reduced
c) Hydrolysed
d) Polymerised

33. In respiration, oxygen is –
a) Oxidised
b) Reduced
c) Both
d) None

34. In electrolysis, oxidation occurs at –
a) Cathode
b) Anode
c) Both
d) None

35. In electrolysis, reduction occurs at –
a) Cathode
b) Anode
c) Both
d) None

36. During corrosion, which part of metal acts as anode?
a) Exposed area
b) Protected area
c) Impure area
d) Non-metal area

37. Which metal does not corrode easily?
a) Gold
b) Iron
c) Zinc
d) Aluminium

38. Electrochemical cells are based on –
a) Redox reactions
b) Acid-base reactions
c) Precipitation reactions
d) Hydrolysis

39. The oxidising agent in hydrogen peroxide is –
a) Oxygen

b) Hydrogen
c) Water
d) Both a and b

40. The reducing agent in hydrogen peroxide is –
a) Hydrogen
b) Oxygen
c) Both a and b
d) None

41. The oxidation number of N in NH_4NO_3 (ammonium nitrate) is –
a) +3 and +5
b) +4
c) +2 and +6
d) 0

42. The oxidation number of Cr in Cr_2O_3 is –
a) +2
b) +3
c) +6
d) +4

43. In acidic medium, dichromate ion changes to –
a) Cr^{3+}
b) Cr^{2+}
c) Cr^{6+}
d) Cr^{4+}

44. Which compound is used in volumetric analysis as oxidising agent?
a) $K_2Cr_2O_7$
b) Na_2SO_3
c) NaCl
d) NH_4Cl

45. In reaction between $K_2Cr_2O_7$ and $FeSO_4$ in acidic medium, Cr is –
a) Reduced
b) Oxidised
c) Unchanged
d) None

46. Redox reactions are important in –
a) Batteries
b) Metallurgy
c) Photosynthesis
d) All of these

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47. Extraction of metal from its ore often involves –
    a) Oxidation
    b) Reduction
    c) Both
    d) None

48. In redox titrations, the end point is indicated by –
    a) Colour change
    b) Odour change
    c) Temperature change
    d) Precipitation

49. The oxidising agent in acidified $K_2Cr_2O_7$ solution is –
    a) $Cr_2O_7^{2-}$
    b) Cr^{3+}
    c) H^+
    d) SO_4^{2-}

50. In bleaching action of SO_2, the gas acts as –
    a) Reducing agent
    b) Oxidising agent
    c) Catalyst
    d) None

✅ Answers – SET 4

1–d 2–d 3–c 4–a 5–b 6–c 7–a 8–b 9–d 10–a
11–a 12–a 13–a 14–c 15–b 16–b 17–a 18–a 19–b 20–b
21–b 22–a 23–a 24–b 25–a 26–a 27–b 28–a 29–a 30–a
31–c 32–b 33–b 34–b 35–a 36–c 37–a 38–a 39–a 40–b
41–a 42–b 43–a 44–a 45–a 46–d 47–b 48–a 49–a 50–a