



AKSHEYAA COLLEGE OF ENGINEERING

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DEPARTMENT OF SCIENCE AND HUMANITIES

QUESTION BANK (Common to all branches)

Subject: CY6251- Engineering Chemistry – II

PART-A Questions

UNIT- I WATER TECHNOLOGY

1. What is calgon conditioning?
2. What is meant by caustic embrittlement? How can we prevent it?
3. Differentiate between sludge and scale.
4. Soft water is not demineralised water whereas demineralised water is a soft water, justify.
5. What is Reverse Osmosis?
6. Define hardness of water?
7. Distinguish between soft water & demineralised water.
8. What is boiler feed water? Mention its requisites.
9. Why is water softened before using in boilers?
10. What are priming & foaming? How can we prevent it?
11. What are boiler troubles?
12. What is desalination?

Unit - II ELECTROCHEMISTRY AND CORROSION

13. What are the conditions for an electrochemical cell to act as a standard cell?
14. What is electroplating and electroless plating?
15. Define single electrode potential. Mention the factors affecting it.
16. Define electrochemical series. Mention its significance.
17. What is salt bridge? Mention its factors.
18. What are galvanic /electrochemical cells?
19. Calculate the reduction potential of Lead electrode in contact with a solution of 0.018 M Pb^{2+} ions. [$E^\circ = - 0.13V$]
20. State Pilling-Bedworth rule. Mention its importance.
21. Define galvanizing.
22. What is the effect of H_2S when it comes into contact with Fe metal?
23. What is corrosion? What are its types?

UNIT- III

ENERGY SOURCES

24. What is a fuel cell? What are its advantages?
25. What is a breeder reactor?
26. What are fissile & fertile nucleides?
27. Distinguish between nuclear fission & fusion reactions.
28. Write any two advantages of fuel cells.
29. What are non – conventional energy sources? Give two examples.
30. Define critical mass, super critical mass and sub critical mass.
31. Give any two advantages of alkaline battery over dry cell.
32. What is a battery? Mention its requirements.
33. What are Primary & Secondary cells? Give examples.
34. Lithium cell is the cell of future, why?

UNIT - IV

ENGINEERING MATERIALS

35. How is RUL measured?
36. How are refractories classified? Give examples.
37. What is meant by thermal spalling? How is it minimized?
38. What are abrasives? How are they classified? Give examples.
39. Define glass and Mention its composition.
40. Write the properties and uses of soda glass.
41. Write the properties and uses of hard glass.
42. Write the composition of flint glass and mention its uses.
43. Write the properties and uses of glass wool.
44. Write the properties and uses of white cement.

Unit - V

FUELS AND COMBUSTION

45. What are the desirable characteristics of metallurgical coke? How is coke superior to coal?
46. Define octane number and cetane number.
47. What is knocking? How is it improved?
48. What is CNG and LPG? Give its composition.
49. What is power alcohol and bio-diesel? Mention its advantages.
50. Define GCV and LCV of a fuel.
51. The ultimate analysis of a coal sample contains C = 84%, S = 1.5%, N = 0.6%, H = 5.5% and Oxygen = 8.4%. Calculate GCV.
52. Define the following terms
 - a) Ignition temperature
 - b) Spontaneous Ignition temperature
 - c) Explosive range.

PART-B Questions (Each question carries 8 marks)

UNIT- I WATER TECHNOLOGY

1. Write a short note on demineralization process.
2. With a neat diagram, describe the Reverse Osmosis method for the desalination of brackish water.
3. Give a brief account on disadvantages of using hard water in boilers.
4. What is internal conditioning? What are the various methods of internal conditioning?

Unit- II ELECTROCHEMISTRY AND CORROSION

5. Derive Nernst equation. Mention its applications.
6. What is EMF series? Mention its significance.
7. Discuss the mechanism of chemical and electrochemical corrosion.
8. What is cathodic and anodic protection for controlling corrosion? Discuss their merits and demerits.
9. What is paint? Explain its constituents and function.
10. What is differential aeration corrosion? Write its mechanism. Give any illustration that show differential corrosion.

UNIT- III ENERGY SOURCES

11. What is a nuclear reactor? Explain the process of power generation using a neat diagram.
12. Write a note on Lithium batteries.
13. What are solar cells? What are the challenges involved in the conversion of solar energy in to useful energy?
14. How is NICAD battery constructed? Explain the cell reaction involved.
15. What is reversible battery? Describe the construction and working of lead acid storage battery?
16. What are fuel cells? Describe the construction and working of Hydrogen – Oxygen fuel cell.

UNIT - IV ENGINEERING MATERIALS

17. Write detailed notes on synthetic abrasives.
18. Explain the various properties of refractories.
19. Explain the chemistry of setting and hardening of cement.
20. Explain the manufacture of Portland cement with proper flow sheet diagram.
21. Explain the various steps involved in the manufacture of glass.

Unit - V

FUELS AND COMBUSTION

22. Describe the Analysis of Coal and its significance.
23. How is metallurgical coke manufactured by Otto Hoffmann process? Mention its properties and uses.
24. What is meant by crude petroleum? Discuss the steps involved in the refining of petroleum of crude oil.
25. What is meant by hydrogenation of coal? How will you manufacture Synthetic petrol by Bergius process?
26. How is producer gas and water gas manufactured?
27. How is the flue gas analysis carried out by Orsat apparatus? Explain it with a neat diagram.