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Total No. of page(s): 1

SE-MDQ/O-20: 3746
Paper-XII: Inorganic Chemistry (General)

Time: 3 hrs]

[Max. Marks: 60

Note: Attempt any five questions.

SECTION -A

- Q.1 a) Define water pollution. Enlist the main inorganic and organic pollutants in water. (6)
b) Write short note on following
i) Biological Oxygen Demand (3)
ii) Water Quality standards. (3)
- Q.2 a) Give Chemistry of smog formation. (3)
b) What are the sources of green house gases? Discuss their effect on climate. (5)
c) Enlist the preventive methods of industrial pollution. (4)

SECTION-B

- Q.3 a) Draw the structures and explain functions of Hemerythrin and Hemocyanins. (6)
b) What is meant by essential and trace metals. Give their role in biological processes. (6)
- Q.4 a) Describe the structural changes in Hemoglobin during transport of oxygen. (4)
b) "Cytochromes are evolutionary conservative". Explain. (3)
c) Illustrate the role of Fe-S protein as electron carriers in biological system. (5)
- Q.5 a) Discuss Ilkovic equation and various factors that affect diffusion current. (5)
b) Give theory of slow discharge of ions of Hydrogen Overpotential. (7)

SECTION-C

- Q.6 a) What is the basic principle of Mossbauer spectroscopy? Discuss the Mossbauer spectrum of $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$. (5)
b) Define the term nuclear Quadrupole and Zeeman splitting in Mossbauer spectroscopy. (7)
- Q.7 a) Write an explanatory note on ESCA and its applications. (6)
b) Define photoelectric effect. Draw and explain the possible peaks for HBr molecule. (6)
- Q.8 a) On the basis of IR spectroscopy, explain the coordination behaviour of SCN^- with transition metal ions. (6)
b) Give the Symmetry, Shape and Number of IR modes of SF_4 molecule by using group theoretical approach. (6)