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E+L



SARDAR PATEL UNIVERSITY

6th Semester B.Sc. EXAMINATIONMonday, 27th June 2022.

10.00 a.m. to 12.00 p.m.

Inorganic Chemistry

US06CCHE04

- Notes: (1) All questions are compulsory.
(2) Figures to the right indicate full marks.

Total marks: 70

Que:1 Choose the most appropriate option for each of the following.

[10]

- 1 _____ metal does not form stable corrosion product.
(a) Silver (b) Tin
(c) Gold (d) Platinum
- 2 The film deposited on the anode, _____ the resistance of a cell.
(a) cover (b) decreases
(c) increases (d) neutralize
- 3 The percentage humidity below which the corrosion is negligible and above which it is appreciable is called _____ humidity value.
(a) minimum (b) critical (c) approximate (d) maximum
- 4 _____ is low melting alloy and have property of expansion upon freezing.
(a) Fusible alloy (b) Wood's metal (c) Type metal (d) Light metal
- 5 Bullets are made from _____ alloy.
(a) lead-tin (b) lead-arsenic (c) iron-chromium (d) copper-tin
- 6 A highly resistance alloy system is _____.
(a) iron-silicon (b) iron-chromium
(c) iron-chromium-carbon (d) copper-aluminium
- 7 In _____ type interhalogen compound the central halogen atom provides maximum number of atomic orbital for hybridisation.
(a) XY (b) XY₃ (c) XY₅ (d) XY₇
- 8 An inter-halogen compound may be regarded as the halide of _____.
(a) less electro-positive halogen (b) more electro-negative halogen
(c) more electro-positive halogen (d) highly electro-negative halogen
- 9 Nitroso-sulphuric acid is obtained as an intermediate. It is _____.
(a) H₂SO₄NO (b) HSO₄(NO)₂ (c) HSO₄NO (d) H₂SO₄(NO)₂
- 10 The raw material for manufacture of NaOH by causticizing process is _____.
(a) Na₂CO₃ + Fe₂O₃ (b) NaCl + Na₂CO₃
(c) Na₂CO₃ + milk of lime (d) brine solution

Que:2 Fill in the blanks selecting the appropriate option in the bracket:

[08]

- 1 In case of concentration cell corrosion the poor oxygenated part is considered as _____. (anode / cathode)
- 2 _____ is not passivator. (Chromic acid / Conc. HCl)
- 3 Eutectic alloy of lead-tin has composition _____.
(38 % tin and 62 % lead / 38 % lead and 62 % tin)

- 4 Hardener alloy generally consist of mixture of constituent metals.
(50 % - 50 % / 25 % - 75 %)
- 5 _____ cannot form any interhalogen compounds. (Chlorine / Fluorine)
- 6 T-shaped structure of ClF_3 molecule is due to _____ hybridisation of the central Cl atom. (sp^3d / sp^3d^2)
- 7 The constant boiling point mixture of concentrated nitric acid contains _____ concentration. (68 % / 86 %)
- 8 In _____ cell, mercury acts as an intermediate electrode in the manufacture of NaOH. (Nelson / Castner-Kellner)

Que:3 Answer the following in short. (Attempt any ten)

[20]

- 1 Explain the term: Corrosion inhibitors.
- 2 State the ' Pilling-Bedworth' rule of oxidation corrosion.
- 3 Define the term alloy.
- 4 Give the Hume-Rothery's ratio rule.
- 5 Give the limitation of peroxide theory.
- 6 Explain the term 'Substitutional alloy'.
- 7 Give the definition of 'interhalogen' compounds.
- 8 Define polyhalides ions and polyhalides.
- 9 IF_6^- ion is $\text{AB}_6(\text{Ip})$ type species.Explain.
- 10 Give main uses of nitric acid.
- 11 Give the main uses of sodium hydroxide.
- 12 Explain the concentration of chamber acid by Gillard tower.

Que:4 Long Answer Question (Attempt Any Four)

[32]

- 1 Interpret the term passivity on the bases of 'Protective layer theory'.
- 2 What is meant by concentration cell corrosion? Explain.
- 3 Discuss ferrous and non ferrous alloys with suitable examples.
- 4 Discuss the effect of alloying and properties of alloying.
- 5 Discuss the shape of ICl_4^- on the bases of hybridisation.
- 6 Explain IF_5 is square pyramidal while IF_7 is pentagonal bipyramidal molecule.
- 7 Describe the electrolytic process for the manufacture of sodium hydroxide.
- 8 Describe the lead chamber process in detail for the manufacture of sulphuric acid.
