

(39 & A-16)

Seat No. _____

No. of Printed Pages: 02

SARDAR PATEL UNIVESITY
B. Sc. - VIth – SEMESTER (CBCS)

Monday, Date : 02-04-2018

Session: Morning, Time: 10:00 A.M. To 01:00 P.M.

Subject/Course Code: US06CCHE04

Subject/Course Title: Inorganic Chemistry

Total Weightage/Marks: 70

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

Q : 1 Choose the most appropriate option for the following. [10]

- (i) According to 'Valence Theory' passive iron is in the _____ state.
(a) bivalent (b) zero valent (c) trivalent (d) none of them
- (ii) Although, _____ is placed near the top of the electro-motive force series, yet it resists atmospheric corrosion effectively.
(a) copper (b) zinc (c) sodium (d) aluminium
- (iii) _____ metal(s) do(es) not form stable corrosion product.
(a) Silver (b) Gold (c) Platinum (d) All of them
- (iv) _____ steel is extremely hard, hence find use in armor plate, ball bearings, high speed tool steels, grinding machinery etc.
(a) Vanadium (b) Chromium (c) Cobalt (d) Nickel
- (v) _____ is an example of interstitial alloy.
(a) Bronze (b) Ordinary steel (c) Brass (d) German silver
- (vi) Bullets are made from _____ alloys.
(a) lead-arsenic (b) lead-tin (c) copper-tin (d) iron-chromium
- (vii) The hybridization scheme of ClF_3 molecule shows that this molecule is of _____ type.
(a) $\text{AB}_3(\text{lp})_2$ (b) $\text{AB}_3(\text{lp})_1$ (c) $\text{AB}_3(\text{lp})_3$ (d) $\text{AB}_3(\text{bp})_3$
- (viii) Amongst inter-halogen compounds _____ are in maximum number.
(a) chlorides (b) iodides (c) fluorides (d) bromides
- (ix) Which of the following substance gives carbon with concentrated H_2SO_4 ?
(a) Oxalic acid (b) Formic acid (c) Starch (d) Ethanol
- (x) In contact process of manufacturing sulphuric acid, the impurities of As_2O_3 is removed by ----
(a) $\text{Al}(\text{OH})_3$ (b) $\text{Cr}(\text{OH})_3$ (c) Fe_2O_3 (d) $\text{Fe}(\text{OH})_3$

Q : 2 Attempt any ten questions of the following. [20]

- (i) Explain immersed corrosion by "Acid-Theory."
(ii) State 'Pilling-Beidworth' rules of oxidation corrosion.
(iii) Explain the term 'corrosion inhibitors'.
(iv) Write the characteristics of any two type of steels.
(v) State the Tamman's rules.
(vi) Explain electro-deposition and compression method for the preparation of alloys.

- (vii) Explain the term 'Inter-halogen compounds'.
- (viii) Give the hybridization scheme of central I- atom of IF_7 molecule.
- (ix) IF_6^- ion is $AB_6(lp)$ type species. Explain.
- (x) H_2SO_4 neutralizes alkalis to give two series of salts. Explain.
- (xi) Give the uses of nitric acid.
- (xii) Explain the causticizing process for the manufacture of sodium hydroxide.

Q : 3 Attempt the following.

- (a) Interpret the term 'passivity' on the basis of protective layer theory. [5]
- (b) Describe the factors determining rate of corrosion for metal sheltered from rain under gaseous environments. [5]

OR

Q : 3 Attempt the following.

- (a) Explain immersed corrosion by Modern electro-chemical theory. [5]
- (b) What is meant by concentration cell corrosion? Explain briefly. [5]

Q : 4 Attempt the following.

- (a) Discuss in detail the fusion method for the preparation alloys. [5]
- (b) Classify alloys. Discuss non-ferrous alloys in detail. [5]

OR

Q : 4 Attempt the following.

- (a) What is meant by substitutional alloys? Discuss the phase diagram of brass alloy. [5]
- (b) Explain Hume-Rothery's rules for the formation of alloys. [5]

Q : 5 Attempt the following.

- (a) Explain $[ICl_2]^+$ ion is V-shaped species while $[ICl_4]^-$ ion has square planar geometry. [5]
- (b) Describe the preparation and structure of IF_5 inter-halogen compound. [5]

OR

Q : 5 Attempt the following.

- (a) Write a note on poly-halide ions and poly-halides. [5]
- (b) Discuss the structure and geometry of XY_3 type inter-halogen compounds. [5]

- Q : 6** Discuss the manufacture of nitric acid by Ostwald's process in detail and give it's chemical behavior with metals. [10]

OR

- Q : 6** Describe the contact process for the manufacture of sulphuric acid. Draw a neat labeled diagram of process. Interpret, the importance of sulphuric acid in industries. [10]