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Sardar Patel University Examination

B.Sc. (Fifth Semester)

Friday, 15th November, 2013

Subject code: US05CICV02 (Heavy and Fine Inorganic Chemicals)

Industrial Chemistry Vocational

Time: 10:30am to 1:30pm

Total Marks: 70

Q-1 Select right option from given in the following questions. (10)

- I In yellow phosphorous manufacturing, the furnace gases pass into coolers where the vapors are liquefied and separated from the?
(a) CO₂ (b) NH₃ (c) CO (d) None of these
- II In HNO₃ manufacturing, gas passes downward with velocity design to give a contact time of about?
(a) 2.5 x 10⁻³sec (b) 2.5 x 10⁻⁴sec (c) 2.0 x 10⁻⁴sec (d) 2.5 x 10⁻²sec
- III On which content of the raw material, the yield of the phosphorous based on?
(a) Silica (b) Coke (c) Calcium phosphate (d) None of these
- IV In bromine manufacturing, with which gas acid solution is treated, which reoxidizes the bromine back to free bromine?
(a) Hydrogen (b) Chlorine (c) Fluorine (d) Carbon dioxide
- V When Glauber's salt is desired, the salt cake dissolved in hot water to form _____ solution.
(a) 36°Be (b) 28°Be (c) 32°Be (d) None of these
- VI The brine is first aerated to remove most of?
(a) Hydrogen sulfide (b) Carbon dioxide (c) Chlorine (d) None of these
- VII In manufacturing of sodium bicarbonate, at which temperature carbonation tower is maintained?
(a) 40°C (b) 50°C (c) 30°C (d) 25°C
- VIII In which solvent, sodium methoxide is soluble?
(a) CH₃OH (b) DMF (c) CHCl₃ (d) H₂O
- IX Which column packing most widely used for adsorption chromatography?
(a) Starch (b) Aluminum oxide (c) Inulin (d) Calcium carbonate
- X Ninhydrin is used for detecting?
(a) Ammonia (b) Phenol (c) Protein (d) None of these

Q-2 Answer any ten of the following: (20)

- I Enlist various methods of concentration of nitric acid
- II Write uses of ammonia
- III Enlist the raw materials required for manufacture of Triple superphosphate
- IV Enlist various raw materials used for manufacture of iodine and fluorine
- V Enlist the raw material and various methods used for titanium dioxide manufacturing
- VI Write properties and uses of perchloric acid
- VII Write properties of sodium borohydride
- VIII Enlist various methods for preparation of sodium carbonate
- IX Write preparation Fehling solution No. 1
- X What is Nujol?
- XI Write the properties and uses of methanol
- XII Write the uses of ethanol

P.T.O

Q-3 Enlist various methods and uses of manufacture of phosphoric acid. With the help of flow diagram explain any one method for manufacture of phosphoric acid in detail (10)

OR

Q-3 With the help of flow diagram explain the manufacture and uses of super phosphate & gypsum (10)

Q-4 I With the help of flow diagram explain the manufacture of sodium sulfite. (05)

II With the help of flow diagram explain the manufacture of sodium chloride by multiple effect evaporation method. (05)

OR

Q-4 I With the help of flow diagram explain the manufacture of sodium sulfate from natural brine (05)

II With the help of flow diagram explain the manufacture of bromine (05)

Q-5 I With the help of flow diagram explain the manufacture of sodium borohydride (05)

II Explain the steps ammoniation of brine and carbonation steps of solvay's ammonia soda process with neat diagram for manufacture of soda ash. (05)

OR

Q-5 Write a short note on following:

I Sodium bicarbonate (05)

II Baking powders (05)

Q-6 I With the help of flow diagram explain the manufacture of chloroform (05)

II With the help of flow diagram explain the manufacture of carbon tetrachloride (05)

OR

Q-6 I With the help of flow diagram explain the manufacture of ethanol using indirect hydration (05)

II With the help of flow diagram explain the manufacture of methanol using catalytic hydrogenation of carbon monoxide. (05)

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