

BACHELOR OF CHEMICAL ENGINEERING EXAMINATION, 2018 (Old)(2nd Year, 2nd Semester)**CHEMICAL TECHNOLOGY - I**

Time: Three hours

Full Marks: 100

Answer any TEN questions

1. Make a comparative study between the merits and demerits of chemical treatment, ozone treatment and application of pulsating electric field for cooling tower water treatment.
2. What is Caustic embrittlement of the material of a boiler? How is it taken care of?
3. Describe the SO₂ to SO₃ converter section of a DCDA plant (Flowsheet not needed).
4. Briefly describe how hydrochloric acid is manufactured by Mannheim process (Flowsheet not needed).
5. What are the main reasons of NO_x emissions in a nitric acid manufacturing plant? What are the remedial measures?
6. Briefly discuss the steps in the production of 99% NaOH from the catholyte liquor of membrane cell.
7. Describe the chlorine handling section of a chlor-alkali plant.
8. The reaction shown by the equation: $2 \text{NaCl} + \text{CaCO}_3 \rightarrow \text{Na}_2\text{CO}_3 + \text{CaCl}_2$ never takes place, yet this is the net overall reaction of Solvay process. How is it made possible?
9. A modern cement plant uses Dry process with pre-heater pre-calciner sections. Why?
10. Briefly discuss the Ammonium Nitrate manufacturing process (Flowsheet not needed).
11. Briefly discuss the nitrogen-hydrogen gas mix production process (for ammonia synthesis plant) by steam reforming of natural gas (Flowsheet not needed).