

College of Engineering-Pune
Shivajinagar, Pune-411005

FY B Tech
Chemistry (AS-103)
End-Semester Exam (May, 2012)

11/05/2012

Max Marks: 50

Total time: 3 hrs

Instructions:

- 1) All the questions are compulsory.
- 2) Figures to the right indicate full marks.
- 3) Draw figures wherever necessary.

Q.1 (a) Explain the electromagnetic spectrum. 05
Write applications of various bands of electromagnetic spectrum.

OR

Describe the Process of fractional distillation of crude oil.

(b) Differentiate between diamond and graphite 03

(c) Comment on dielectric constant of water 02

Q.2 (a) Define following terms for battery technology (any two) 03

1. Energy density of battery

2. Power density of battery (specific power)

3. Cell capacity

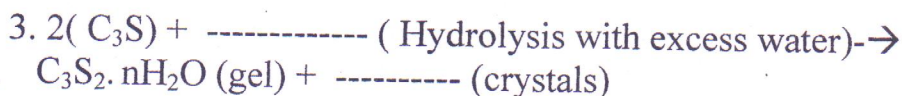
(b) How the life of the boiler can be prolonged? 04

OR

Explain in detail the problems of the boiler due to corrosion and caustic embrittlement.

(c) Fill in the gaps by appropriate chemical formula of the reactions 03
involved in

settings and hardening of cement





Q.3 (a) Explain construction and working of H_2-O_2 fuel cell 05

OR

Explain the construction and working of Lead acid battery

(b) The absorption readings of 0.2N, 0.4N, 0.6N, 0.8N and 1N solutions of $K_2Cr_2O_7$ are 50, 102, 148, 196 and 246 respectively. Find out the concentration of unknown $K_2Cr_2O_7$ solution having absorption of 165 units. 03

(c) Mention the type of corrosion protection method used in following examples: 02

1. Zinc metal is attached in-front of the ship.
2. Mild steel vessel is coated with Cr metal
3. Al_2O_3 layer is generated in Al alloy wheel
4. Zn metal is coated on mild steel connectors

Q.4 (a) Explain the working of UV-Visible spectrophotometer in detail. 04

(b) Why most of the automobile components are made up of alloy steels rather 03

than pure metals. 03

(C) Explain in detail conduction and luster of metals

Q.5 (a) Why Ion selective electrode is used in pH-metric titration. Explain in detail. 04

(b) Explain the properties of the Portland cement with respect to hardening, heat effects, time of setting, fine-ness and volume change. 03

(c) Write the statement of Beer's law, Lambert's Law and state their limitations.