

1E1004

Roll No. \_\_\_\_\_

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B. Tech. I-Sem. (Reback) Exam., Feb. 2013

Engg. Chemistry

(Common to all branches of Engg.)

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

*Instructions to Candidates:*

Attempt any **five** questions, selecting **one** question from each unit. All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.

1. \_\_\_\_\_

2. \_\_\_\_\_

**UNIT - I**

- Q.1. (a) What is hard water? Determine the hardness of water by EDTA Method. How would you define the degree of hardness? [3+4+3]
- (b) 200 Litres of NaCl Solution containing 85 g/l of NaCl was required to regenerate a completely exhausted zeolite softener. How many Litres of hard water of hardness 600 ppm can be softened by the softener? [6]

**OR**

- Q.1. (a) What are boiler troubles and their consequences? How can these be minimized? [8]
- (b) Write notes on any TWO of the following:
- (i) Sedimentation.
  - (ii) Desalination.
  - (iii) Permut Process for Softening water.
  - (vi) Ion exchange Resins. [4+4=8]

**UNIT - II**

- Q.2. What is meant by gross and net calorific value of fuel? Describe the working of Bomb Calorimeter for determining the calorific value of a solid fuel. [8+8=16]

**OR**

- Q.2. (a) The amount of air needed for the complete combustion of one litre of water gas is 2.3 litre at STP. If 25% excess air is used, calculate the volume of air used at 750 mm pressure and 26°C. [4]
- (b) Write notes on any THREE of the following:
- (i) Knocking.
  - (ii) Octane number.
  - (iii) Catalytic Cracking.
  - (iv) Synthetic Petrol.
  - (v) Ultimate analysis of Coal. [4+4+4=12]

**UNIT - III**

- Q.3. (a) What is phase rule? Explain one component system of water using suitable diagrams. [8]
- (b) Write notes on any Two of the following:
- (i) Cloud and Pour Point.
  - (ii) Viscosity and Viscosity Index.
  - (iii) Emulsification. [4+4=8]

**OR**

- Q.3 (a) What is natural rubber? How and why it is vulcanised? Explain with examples. [8]
- (b) Write down the mechanism of the addition polymerization. [8]

UNIT – IV

- Q.4. (a) Discuss with examples, the Corrosion. Explain it's significance. [8]  
(b) Explain Cathodic protection method to minimize corrosion [8]

OR

- Q.4. Write notes on any THREE of the following: [16]  
(a) Galvanic Cell.  
(b) Pitting Corrosion.  
(c) Fullerenes.  
(d) Optical fibers.  
(e) Superconductivity.

UNIT – V

- Q.5. What are refractories? How refractories are classified? Give essential requirements of good refractories. [16]

OR

- Q.5. Write note on any THREE of the following: [16]  
(i) Vertical Shaft Kiln (V.S.K.) Technology.  
(ii) Setting and hardening of Cement.  
(iii) Borosilicate Glass.  
(iv) Annealing.  
(v) Devitrification.
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