Code No: R13104 **R13** SET - 1

I B. Tech I Semester Supplementary Examinations, May - 2017
ENGINEERING CHEMISTRY
(Com. to CE, ME, CSE, IT, CHEM, AE, AME, MTE, MM, PE, PCE, TE)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is Compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1. a) Why can caustic embrittlement be controlled by adding sodium sulphate to boiled feed water? (3M)
   b) What is the reason for liquid crystals being used as thermometers? (4M)
   c) Calculate the mass of the air needed for complete combustion of 5 kg of coal contain: C=80% H=15% O=Rest (4M)
   d) What is impressed current cathodic protection? (4M)
   e) Why is salt bridge used in the construction of a cell? (3M)
   f) Discuss mechanical properties of polymers. (4M)

PART –B

2. a) Explain the determination of net calorific value of coal from the data of ultimate analysis. (8M)
   b) Describe, with a neat sketch, the process of compression moulding. How does it compare with injection moulding? (8M)

3. a) What are the natural and synthetic zeolites? Explain the zeolite process for the external treatment of boiler feed water and what are its limitations and advantages. (8M)
   b) Explain the measurement of PH of solution using glass electrode. Mention the advantages of this electrode. (8M)

4. a) Define octane number and cetane number. What structural features of hydrocarbons are in unlead petrol and diesel? What are structural factors that promote its high value? (8M)
   b) Explain any three green synthetic methods with examples. (8M)

5. a) (i) Calculate the quantity of lime and soda required for softening 50, 000litres of water containing the following salts per litre: $Ca(HCO_3)_2$=8.1mg/L; $Mg(HCO_3)_2$ =7.5mg/L; $CaSO_4$=13.6mg/L;$MgSO_4$=12.0mg/L; $MgCl_3$=2. 0mg/L and NaCl = 4.7 mg/L. (ii) Describe the estimation of hardness of water by EDTA method. (8M)
   b) (i) Discuss the importance of design and material selection in controlling corrosion. (8M)
   (ii) Explain dry corrosion and its mechanism.

6. a) (i) Mention the advantages of synthetic rubber over natural rubber. (8M)
   (ii) What is meant by coordination polymerization?
   b) Derive Nernst equation for single electrode potential and explain the terms involved it. Write its applications. (8M)

7. a) Discuss the chemical vapour deposition method of producing carbon nano tubes and applications of CNTs. (8M)
   b) What are the constituents of paints? Illustrate each with examples. (8M)
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