

## FACULTY OF ENGINEERING &amp; TECHNOLOGY

F.E.[Online Theory] Examination - DEC – 2014

Engg. Chemistry and Environmental Science (Revised)

[Time: Two Hours]

[Max. Marks: 40]

“Please check whether you have got the right question paper.”

N.B

- 1) Question number one is compulsory.
- 2) Solve any two questions from remaining questions.
- 3) Figures to the right indicate full marks.
- 4) Use of non-programmable calculator is allowed.

## SECTION-A

- Q.1 A) Answer the following questions (any five) 10
- a) Water containing calcium bicarbonate is heated to boil. What is effect on its hardness?
  - b) Write equations to calculate hardness of water in ppm and epm unit.
  - c) Define brackish water and desalination
  - d) Write any four characteristics of good fuels.
  - e) Draw labeled diagram of bomb calorimeter
  - f) Which elements are estimated in cod by ultimate analysis?
  - g) Define polymer and polymerization
  - h) Write steps involved in mechanism of addition polymerization
  - i) Write any four deficiencies of natural rubber.
- Q.2 A) Explain deionization process of water softening. How to regenerate ion exchanger. 06  
 B) Explain R.O. (super filtration) method of water softening. 05  
 C) What is colorimetric? Give its any four applications. 04
- Q.3 A) How moisture and ash in coal is determined by proximate analysis. Give significance of moisture and ash contain. 06  
 B) Explain fractional distillation of petroleum oil. 05  
 C) Define calorific value of coal. Coal containing 3% hydrogen have 6600 cal HCV. Calculate its LCV. 04
- Q.4 A) How plastic is classified? Give their characteristics. 06  
 B) Give preparation, properties and applications of BUNA-S rubber. 05  
 C) Give properties and uses of polyurethanes 04
- Q.5 A) Calculate total, permanent and temporary hardness of water containing 13.6 mg/lit  $\text{CaSO}_4$ , 14.6 mg/lit  $\text{Mg}(\text{HCO}_3)_2$  and 10.8 mg/lit NaCl. Molar masses of  $\text{CaSO}_4$ ,  $\text{Mg}(\text{HCO}_3)_2$  and NaCl are 68.0, 146.0, and 58.5 respectively. 05  
 B) How scale is formed in boiler. Give its disadvantages. 04  
 C) Give advantages of CNG. 03  
 D) Give names with its applications of any three common in gradients of plastics 03