

2E2004

B. Tech. II Sem. (Main/Back) Exam., May - 2019

204 Chemistry &amp; Environmental Engineering

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 26

*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.  
(Mentioned in form No. 205)

1. NIL

2. NIL

**UNIT- I**

- Q.1 (a) What is the hardness of water? Explain temporary and permanent hardness by complexometric method. [8]
- (b) 5gm  $\text{CaCO}_3$  dissolved in dil. HCl and make it up to 1 ltr to prepare standard hard water (SHW). 20ml of this standard hard water consumed 18ml of EDTA on titration using EBT as an indicator. Similarly 20ml of Hard water and boiled water each consumed 15ml and 12ml of EDTA respectively. Calculate temporary, permanent and total hardness of water. [8]

**OR**

- Q.1 (a) What are the requisites of potable water? How will you purify municipal water mentioning different steps? [8]
- (b) Write notes on the following (any two)- [8]
- (i) Break point chlorination
  - (ii) Sedimentation with coagulation Disinfection

## UNIT- II

- Q.2 (a) Describe the Bomb calorimeter for the determination of calorific value of solid fuel. [8]
- (b) A coal sample found to have following composition- [8]  
C = 76%, H = 8.0%, O = 5.4%, S = 3.5%, N = 3.0%, Ash = rest.  
Calculate minimum amount of oxygen and air required (by weight) for complete combustion of 1kg of coal. Calculate amount of air required if 50% excess air is supplied.

### OR

- Q.2 (a) Explain high and low calorific value of fuel. How will you determine calorific value of gaseous fuel by Junker's calorimeter? [8]
- (b) Write short notes on the following- (Any two) [8]  
(i) Flue gas analysis by Orsat's apparatus  
(ii) Proximate Analysis  
(iii) Sludge and Scale

## UNIT- III

- Q.3 (a) What is EIA? Explain methodology and necessity of EIA. [8]
- (b) Give Environmental Acts and regulations in India. [8]

### OR

- Q.3 (a) What are the major sources of Renewable energy? Explain Bio-energy. [8]
- (b) Write the notes on following- <http://www.rtuonline.com> [8]  
(i) Carbon cycle  
(ii) Biodiversity

## UNIT- IV

- Q.4 (a) Discuss the Acid Rain and Green House effect. [8]
- (b) What is Air pollution? What are the major sources of Air pollution? Discuss the adverse effects of Air pollution. How can Air pollution be minimized? [8]

**OR**

- Q.4 (a) What is ozone depletion? Discuss the mechanism of depletion of ozone layer. What are the harmful effect of Ozone Depletion? [8]
- (b) What is solid waste management? Explain the classification and disposal of solid waste management. [8]

**UNIT- V**

- Q.5 (a) What is Rain Water Harvesting? Discuss the Rain water harvesting methods. [8]
- (b) Explain the methodology of waste water treatment. [8]

**OR**

- Q.5 What is Corrosion? Discuss the mechanism of electrochemical corrosion. Explain cathodic protection methods to minimize corrosion. [16]

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