

**ALIAH UNIVERSITY**

**Subject: Engineering Chemistry**

**Subject Code: CHMUGBS01/CH152**

**Time: 3 Hrs.**

**End Semester Examination (Semester-II; 2020-21)**

**Full Marks: 80**

**Group A (Answer any eight)**

1. Write short note on: (5)
  - a. Bakelite
  - b. Teflon
2. Explain with examples: Conducting Polyaniline & GuttaPercha (5)
3. Why are silicones called Inorganic Polymers? Discuss the synthetic procedure of linear chain silicones (5)
4. (i) What is meant by green chemistry  
(ii) Write informative note on the mechanism of radical polymerisation (5)
5. Write down the importance of Green Chemistry. Give the detail of the preparation of Aspirin from Salicylic acid using Green Synthesis (5)
6. Explain with examples: (i) Phenol formaldehyde resins  
(ii) Microwave radiation of Green Synthesis (5)
7. How would you prepare Adipic Acid by Green Method? Write an essay on the various types of synthetic rubbers (2+3)
8. What is meant by the Vulcanization of Rubber? Write its uses (3+2)
9. What is Bio-polymers? How is it prepared? Give some importance of Bio-polymers (5)
10. Write notes on : (i) Polyvinyl chloride (PVC)  
(ii) Polystyrene (PS) (5)

**Group-B**

1. Choose the correct alternatives for five of the following: 5×1=5
  - (i) Which of the following can be used for disinfection of water?
    - (a) Chlorine
    - (b) Hydrogen peroxide
    - (c) Ozone
    - (d) None of these

(ii) The degradation of BOD is classified as what type of reaction?

- (a) First Order Reaction
- (b) Zero Order Reaction
- (c) Second Order Reaction
- (d) Third Order Reaction

(iii) Disease associated with Mercury is

- (a) Black foot disease
- (b) Minamata disease
- (c) Itai-Itai disease
- (d) Parkinson's disease

(iv) According to recommended total hardness permissible limit, which value is acceptable for drinking water

- (a)  $> 550\text{mg/l}$
- (b)  $> 250\text{mg/l}$
- (c)  $> 750\text{mg/l}$
- (d)  $> 600\text{mg/l}$

(v) BOD is

- (a) Amount of  $\text{O}_2$  required respiring
- (b) Amount of  $\text{O}_2$  to decompose
- (c) Amount of  $\text{O}_2$  to inhale
- (d) Amount of  $\text{O}_2$  to measure COD

### **Group-C**

4×5=20

(Short answer type questions)

Answer the following questions.

2. What is meant by hardness of water? Can hard water be used in boilers or in laundries? Justify your answer. [2+3]

3. What are the biochemical effects of Arsenic and Lead pollution? [2+3]

4. What is Dissolved Oxygen (DO)? What is its importance as water quality parameter?  
[2+3]

5. In a BOD test 5

(i) Why it is necessary to cover the bottle with a stopper?

(ii) What is the necessity of diluting the waste water sample?

(iii) Why is the test run in dark (or in the dark bottle)?

(iv) What is the necessity of seeding the sample?

(v) Why the ultimate BOD ( $BOD_u$ ) is not measured?

[1+1+1+1+1]

**Group-D** (Answer any three questions) 3×5=15

6. Prove that, the relation  $BOD_t = C_0 (1 - e^{-kt})$  where the terms indicates their usual meaning.

7. Draw a flow sheet of a water treatment plant for treating surface water to confirm public water supply standard.

8. Write a short note on oil pollution in water?

9. Explain Eutrophication process?