

B.Tech I Year I Semester (R15) Regular &amp; Supplementary Examinations December 2017

**ENGINEERING CHEMISTRY**  
(Common to ECE, ME, EIE and IT)

Time: 3 hours

Max. Marks: 70

**PART – A**  
(Compulsory Question)

\*\*\*\*\*

1 Answer the following: (10 X 02 = 20 Marks)

- (a) Hydrazine is a better oxygen scavenger and also green method compared to other methods, give reasons.
- (b) Explain the principle of EDTA titration method and reason out the role of buffer in it.
- (c) Write the synthetic route for making Nylon 6.6.
- (d) Differentiate between the thermoplastic and thermosetting polymers and give an example for each.
- (e) How is galvanic corrosion prevented?
- (f) A bridge is effected by electro chemical corrosion and write a mechanism and suggest the solution to control it.
- (g) What are characteristics of a good fuel?
- (h) What would happen if we increase or decrease the concentration of sulfuric acid in lead acid battery?
- (i) Write note on chemical composition of cement.
- (j) What are the characteristics of a good refractory material?

**PART – B**  
(Answer all five units, 5 X 10 = 50 Marks)**UNIT – I**

2 Elaborate on the treatment of drinking water for municipal supply including chlorination process

**OR**3 Calculate the amount of lime (84% pure) and soda (92% pure) required for treatment of 30,000 liters of water, whose chemical analysis results the following constituents per liter  $\text{Ca}(\text{HCO}_3)_2 = 40.5 \text{ mg}$ ;  $\text{Mg}(\text{HCO}_3)_2 = 36.5 \text{ mg}$ ;  $\text{MgSO}_4 = 30.0 \text{ mg}$ ;  $\text{CaSO}_4 = 34.0 \text{ mg}$ ;  $\text{CaCl}_2 = 27.75 \text{ mg}$ ; and  $\text{NaCl} = 10.00 \text{ mg}$ .**UNIT – II**

4 Discuss the synthesis, mechanism and applications of poly aniline and polyacetylene.

**OR**

5 Give brief account on natural and synthetic rubber. And explain the processing and compounding of rubber.

**UNIT – III**

- 6 (a) Compare Nickel Metal hydride and NiCad batteries.
- (b) Lithium ion battery cannot be operated using aqueous electrolyte, why? Find a suitable electrolyte and explain its electrochemistry part.

**OR**

- 7 (a) An electrochemical cell has stable at higher temperature and preferred in power stations. Name the cell and explain it
- (b) Let's dream for a while that JNTU administration has nominated you as a team member of one of its mega projects "Space Exploration". Suggest and explain an auxiliary power supply source for the space vehicle with your electro-chemical skills

**UNIT – IV**

8 Describe the method of determination of calorific value of gaseous fuels by Junkers calorimeter.

**OR**

9 Discuss in detail about the Bergius process and Fischer-Tropsch synthesis for the manufacture of synthetic petrol.

**UNIT – V**

10 Brief account on Fullerenes and Carbon nanotubes.

**OR**

11 What are lubricants? Give a detail account on their classification and properties.

\*\*\*\*\*