Code: 15A51101 **R15**

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

ENGINEERING CHEMISTRY

(Common to ECE, ME, EIE and IT)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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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 $Ca(HCO_3)_2$ = 40.5 mg; $Mg(HCO_3)_2$ = 36.5 mg; $MgSO_4$ = 30.0 mg; $CaSO_4$ = 34.0 mg; $CaCl_2$ = 27.75 mg; and NaCl = 10.00 mg.

UNIT – II

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

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 detailed account on them.

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