



Reg. No. : .....

Name : .....

**Combined First and Second Semester B. Tech. Degree  
Examination, December 2015  
(2013 Scheme)**

**13.103 : ENGINEERING CHEMISTRY (ABCEFHMNPRSTU)**

Time : 3 Hours

Max. Marks : 100

John Cox Memorial CSI Institute of Technology  
Kannammoola, Thiruvananthapuram  
695011

**PART - A**

Answer **all** questions. **Each** question carries **2** marks.

**(10×2=20 Marks)**

1. What are Co-polymers ? Explain with examples.
2. Write a note on preparation and properties of PMMA.
3. Explain Beer-Lamberts law.
4. Write the cell reaction of Cu – Ag cell given that  $E^\circ \text{Ag}^+/\text{Ag} = 0.80\text{V}$  and  $E^\circ \text{Cu}^{2+}/\text{Cu} = 0.34 \text{V}$ . Calculate the emf of the cell at  $25^\circ\text{C}$  when  $[\text{Ag}^+] = 0.1 \text{M}$  and  $[\text{Cu}^{2+}] = 0.01 \text{M}$ .
5. Write a note on solar cells.
6. Distinguish between anodic and cathodic metal coatings.
7. Explain reverse Osmosis.
8. What is e-waste ?
9. Write a note on cetane number.
10. Discuss the chemistry of bio-gas formation.



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## PART - B

Answer **any one full** question from **each** Module. **Each** question carries **20** marks.  
(20×4=80 Marks)

## Module - I

11. a) Discuss the moulding constituents of plastics and explain vulcanization of rubber.  
b) Write a note on chemical shift in NMR spectroscopy.  
c) List the applications of GC and HPLC.

OR

12. a) Explain injection moulding and extrusion moulding.  
b) Explain the different types of electronic transitions in electronic spectroscopy.

## Module - II

13. a) Explain the determination of pH using glass electrode.  
b) Write a note on powder coatings, list its applications and advantages.

OR

14. a) Discuss the electrode reactions of Lithium-ion cell and  $H_2-O_2$  fuel cell.  
b) Write a note on types of electro chemical corrosion.

## Module - III

15. a) Discuss the troubles caused by the use of hard - water in boilers.  
b) Discuss air pollution.

OR

16. a) Discuss the various stages of Municipal water treatment.  
b) What are the various methods employed for solid waste management.

## Module - IV

17. a) Discuss the properties and applications of nano-materials.  
b) Explain the properties of refractories.

OR

18. a) Explain the manufacture of port land cement.  
b) Discuss the manufacture of silica refractories.
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