



Reg. No. :

Name :

**Combined First and Second Semester B.Tech. Degree
Examination, March 2018
(2008 Scheme)
08-103 ENGINEERING CHEMISTRY (CMNPHEARUFBS)**

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** carries **4** marks.

1. Write down the chemical reactions involved in a Nicad cell and represent the cell.
2. What are nanomaterials ? How are they classified ?
3. What are diffusion coatings ? How does it differ from hot dipping ?
4. Which of the following are IR active ?
 O_2 , N_2 , H_2O , CO_2 , HCN , HCl .
Justify your answer.
5. Illustrate the significance of a thermogram in the analysis of a crystalline salt.
6. How is the principle of reverse osmosis applied for desalinating brackish water ?
7. Briefly explain priming and foaming.
8. What is silicone rubber ? Give its preparation, properties and uses.
9. By applying Dulong's formula, calculate the gross and net calorific values of a coal sample which gave the following composition on analysis ;
 $C = 80.2\%$, $H_2 = 8.6\%$, $O_2 = 5\%$, $N_2 = 4$ and ash = 2.2%.
10. Account for the following :
 - a) A rivet undergoes severe corrosion.
 - b) A block of magnesium saves a large marine vessel from corrosion.

P.T.O.



PART – B

Answer **two full** questions from **each** Module. **Each** carries **10** marks.

Module – I

11. Distinguish between fuel cells and storage cells. What are the characteristics of a fuel cell ? Explain the working of $H_2 - O_2$ fuel cell.
12. Discuss the different methods of corrosion control.
13. Explain the principle, procedure and applications of potentiometric titrations. Mention the advantages of this method.

Module – II

14. Derive the relationship between moment of inertia of a diatomic molecule (rigid rotor) and line spacing in microwave spectrum.
15. Explain the different steps involved in municipal water treatment.
16. a) Discuss the major sources of air pollutants and their harmful effects on the environment.
b) Write notes on :
 - i) CFCs
 - ii) Ozone depletion
 - iii) Green House effect.

Module – III

17. What is Portland cement ? How is it manufactured ? Explain the method, with chemical reactions involved.
 18. a) Discuss the mechanism of lubrication.
b) Write notes on the following : viscosity index and aniline point of a lubricating oil.
 19. Explain the important moulding techniques of plastics.
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