

MODEL QUESTION PAPER

CY1X01 ENGINEERING CHEMISTRY

(Common to all Branches of Engineering and Technology)
Regulation 2004

Time 3 Hours

Answer all the Questions

Max Marks: 100

Part A (10 x 2 = 20 Marks)

1. What are abrasive? Name any three natural and artificial abrasives.
2. What are solid lubricants? Name any four solid lubricants.
3. State phase rule. Explain the terms involved in it.
4. State the limitations of phase rule.
5. What is electrochemical series?
6. What is meant by anodizing? Mention two application of anodizing.
7. What is boiler scale? How it is removed?
8. Distinguish between nuclear fission and fusion.
9. What are fuels? How they are classified?
10. Explain Beer-Lamberts law.

Part B (16 x 5 = 80 Marks)

- 11.a). i. Explain Mohr's scale of hardness and describe the classification of abrasives with suitable examples. **8**
- ii. Describe with a neat sketch, the process of compression moldings. How do you compare the technique with injection molding. **8**

OR

- b). i. What is pitting corrosion? Explain the mechanism of chemical and electrochemical corrosion. **8**
- ii. How is coke manufactured by Otto-Hoffman process? **4**
- iii. How is petrol manufactured by Fischer –Tropsch's method? **4**
- 12.a). i. Draw the phase diagram of (Pb-Ag) system forming eutectic alloy and label all the phases in the diagram. **8**
- ii. What is meant by phase diagram? With help of phase diagram explain the following terms (i) triple point (ii) eutectic point. **8**

OR

- b). i. Explain the following in the phase diagram for ice-water-water vapour system.
(1) Bivariant system (2) Univariant system (3) Invariant system **8**
- ii. State the different varieties of brasses and bronze and give their engineering properties and applications. **8**
- 13.a). i. Explain (i) pitting corrosion (ii) stress corrosion **8**
- ii. What is cathodic protection? How it is done by using impressed current and sacrificial anode? Explain with suitable example. **8**

OR

- b). i. What are Paints? What are their characteristics? What are fire retardant paints and water repellent paints? **8**
- ii. Bring out the difference between paints and varnishes and explain the mechanism of drying of paint. **8**
- 14.a). i. Distinguish between hard water and soft water. Describe how the temporary and permanent hardness of water determined by EDTA titration. **8**
- ii. What are boiler troubles? How can scale formation be prevented by calgon conditioning? Describe. **8**

OR

- b). i. Distinguish between softening and demineralization of water. Name any two methods of demineralization of water and explain one briefly. **8**
- ii. Define the term desalination. Describe with a neat diagram desalination by reverse osmosis process. **8**
- 15.a). i. Describe the manufacture of producer gas? Mention its applications. **8**
- ii. Define the terms octane number and cetane number. **4**
- iii. Discuss the anti knocking agents used for petrol. **4**

OR

- b). i. Describe flue gas analysis by Orsat's apparatus. **8**
- ii. Differentiate between IR and UV spectrum. **3**
- iii. Write about the principle and application of flame photometry. **5**