

**Reg. No. :** \_\_\_\_\_

**Question Paper Code : 30130**

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2023.

First Semester

CY 3151 — ENGINEERING CHEMISTRY

(Common to : All branches (Except Marine Engineering))

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

**Answer ALL questions.**

**PART A — (10 × 2 = 20 marks)**

1. State about the influences of TDS and BOD in drinking water.
  2. Write the reasons for the formation of scale and sludge in boilers.
  3. Give the important properties and uses of nano clusters.
  4. Specify the important applications of nano materials in catalysis.
  5. Mention the salient features of composites.
  6. Give a clear note on the reduced phase rule.
  7. Write the analysis of coal by proximate method.
  8. Define carbon foot print.
  9. State the working principle of solar cells.
  10. Give a brief note on the microbial fuel cell.

**PART B — (5 × 16 = 80 marks)**

11. (a) Give a detailed account on the water purification process by demineralization based on ion exchange method with neat diagram. Write equations for the same.

Or

- (b) Discuss the process of desalination of the brackish water by reverse osmosis and distillation processes.

12. (a) Explain the preparation of nano materials by sol-gel and chemical vapour deposition methods with neat diagrams.

Or

- (b) Explain the preparation of nano materials by electrochemical deposition and electro spinning methods with neat diagrams.

13. (a) With a neat diagram, describe the two component system with respect to lead and silver.

Or

- (b) Summarize on the properties and applications of metal matrix composite and ceramic matrix composite.

14. (a) Elaborate the manufacture of metallurgical coke by Otto Hoffmann method.

Or

- (b) Elaborate the analysis of flue gas by Orsat method.

15. (a) Explain the working principle and applications of wind energy and geothermal energy.

Or

- (b) Explain the working principle of lead acid battery and lithium-ion battery.