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Question Paper Code : 90973

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

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. Specify the influence of BOD and COD in water quality parameters.
2. How is caustic embrittlement formed in boilers?
3. State about the properties of nanowire and nanotube.
4. Highlight the applications of nano materials in electronics and catalysis.
5. With suitable example, brief about the polymer matrix composite.
6. Highlight about the applications of hybrid composites.
7. Brief about coal and coke.
8. Write the significances of octane number and cetane number.
9. State on the principle of solar cells.
10. Highlight the important aspects involved in microbial fuel cells.

PART B — (5 × 16 = 80 marks)

11. (a) Discuss the various process in municipal water treatment.

Or

- (b) Elaborate the external treatment suitable for boiler feed water by ion exchange and zeolite process.

12. (a) (i) Distinguish between molecules, nano materials and bulk materials. (8)

(ii) With a neat diagram, explain sol-gel process for the preparation of nanoparticles. (8)

Or

(b) With a neat diagram, explain the preparation of nano tubes by chemical vapour deposition and electrochemical deposition method.

13. (a) Explain systematically about the metal matrix and ceramic matrix composites.

Or

(b) Elaborate on the construction of a simple eutectic phase diagram.

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

Or

(b) Elaborate in a stepwise manner about the flue gas analysis by Orsat method.

15. (a) With neat diagram, explain the working principle of lead acid battery and lithium ion battery. Give necessary chemical reactions.

Or

(b) Explore the recent developments in wind energy and geothermal energy.