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Question Paper Code : 50407

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017

Second Semester

Civil Engineering

CY 6251 – ENGINEERING CHEMISTRY – II

(Common to All Branches Except Marine Engineering)

(Regulations 2013)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions.

PART – A **(10×2=20 Marks)**

1. What happens when temporary hardness water is boiled ? Give equations.
2. What is meant by desalination ?
3. Define reduction potential.
4. A piece of impure zinc and pure zinc are placed in a solution. Which will corrode faster ?
5. Which isotope is used in nuclear reactors ?
6. List out any two applications of solar cell.
7. What is the abrasive used in rock drilling bit ?
8. What is the purpose of annealing glass ?
9. Write down the significances of the presence of nitrogen in coals.
10. Define ignition temperature.

PART – B (5×16=80 Marks)

11. a) i) Explain scale formation in boilers. How are they prevented ? (8)

ii) What are ion exchange resins ? Discuss how hard water is softened by ion exchange process. (8)

(OR)

b) i) Write notes on (i) Caustic embrittlement and (ii) Boiler corrosion. (8)

ii) With the help of a neat diagram, explain reverse osmosis technique in detail. (8)

12. a) i) Derive Nernst's equation for single electrode potential and explain. Write any two applications. (8)

ii) How is emf determined by potentiometric measurement ? Mention any two applications. (8)

(OR)

b) i) Discuss any four factors controlling rate of corrosion. (8)

ii) What are the essential ingredients of paint ? What are their functions ? Give examples. (8)

13. a) i) Distinguish between nuclear fission and nuclear fusion. (8)

ii) Explain essential parts of a nuclear reactor with a neat diagram. (8)

(OR)

b) i) Describe the construction and working of lead acid storage cell. (8)

ii) Explain the working principle of H_2-O_2 fuel cell with reactions. (8)

14. a) i) What is a refractory ? Describe any four important characteristics. (8)

ii) How are abrasives classified ? Describe any two abrasives of each type. (8)

(OR)

b) i) Explain the setting and hardening of Portland cement with chemical reactions involved in it. (8)

ii) Classify the various types of glass and explain any two in detail. (8)

15. a) i) How is proximate analysis of coal carried out ? Explain significance. (8)

ii) Describe in brief, the manufacture of metallurgical coke by Otto Hoffman's oven method. (8)

(OR)

b) i) How is flue gas analysed by Orsat apparatus ? Explain in detail. (8)

ii) A gas used in an IC engine has the following composition by volume.

$H_2 = 45\%$, $CH_4 = 36\%$, $CO = 15\%$ and $N_2 = 4\%$. Find the volume of air required for the combustion of $1m^3$ of the gas. (8)

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