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**Question Paper Code : X11201**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020

First Semester

Civil Engineering

CY 8151 – ENGINEERING CHEMISTRY

(Common to all Branches (Except Marine Engineering))

(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. Distinguish between sludge and scale with an example.
2. What is calgon conditioning ?
3. Write any two difference between physical and chemical adsorption.
4. What is meant by catalytic poisoning ?
5. Define the term alloy and its significance with an example.
6. What is meant by eutectic point ?
7. Write the classification of fuels with an example.
8. Define the term spontaneous ignition temperature with an example.
9. Mention any two examples for secondary cells.
10. What are fast breeder reactors ?

PART – B

(5×16=80 Marks)

11. a) What are external treatments ? With a neat diagram explain the desalination of water by ion-exchange and reverse osmosis processes. (16)

(OR)

- b) Define hardness of water and explain the experimental determination of hardness of water by EDTA method. (16)



12. a) i) What are adsorption isotherms ? Explain the five different forms of adsorption isotherms with suitable examples. (8)  
ii) Write informative notes on Langmuir adsorption isotherm. (8)  
(OR)
- b) i) What are enzyme catalysis ? Derive and expression for Michael Menton equation and its significance. (10)  
ii) Differentiate between auto catalysis and catalytic promoters with examples. (6)
13. a) Explain the heat treatment of steel in detail. (16)  
(OR)
- b) Deduce the phase diagrams of one component water system and two component lead-silver system and write informative notes on their number of phases, components and eutectic points etc. (16)
14. a) i) Explain how is metallurgical coke manufactured by Otto-Hoffman methods. (10)  
ii) Differentiate between gross and net calorific value with an example. (6)  
(OR)
- b) i) With a neat picture explain the manufacture of synthetic petrol by Bergius Process. (10)  
ii) Distinguish between octane and cetane number with examples. (6)
15. a) What are nuclear fusion and fission reactions ? Explain them in detail along with their significance. (16)  
(OR)
- b) Write informative notes on the following :  
i) Lithium ion battery and its working mechanism with a neat diagram. (8)  
ii)  $H_2O_2$  fuel cell and its working mechanism with a neat diagram. (8)
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