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**Question Paper Code : X60404**

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020  
First Semester  
Civil Engineering  
CY 2111/CY 14/080010001 – ENGINEERING CHEMISTRY – I  
(Common to all Branches)  
(Regulations 2008)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A

(10×2=20 Marks)

1. What is alkalinity ? What are its types ?
2. What is reverse osmosis ?
3. What is Teflon ? How is it formed ?
4. What is co-polymerization ? Give one example.
5. Write the differences between physisorption and chemisorption
6. Give the principle of ion exchange adsorption.
7. Distinguish between nuclear fission and nuclear fusion.
8. How Ni-Cd battery is constructed ?
9. Define viscosity index. How it is determined ?
10. What are the special characteristics of carbon nanotubes ?

PART – B

(5×16=80 Marks)

11. a) i) Define hardness. How is it determined ? (10)  
ii) Give a brief note on the disadvantages of using hard water in boilers (6)
- (OR)
- b) i) What is internal conditioning ? What are the various methods of internal conditioning ? Explain. (10)  
ii) Write a note on demineralization process. (6)



12. a) i) Explain the mechanism of free radical polymerization. (8)  
ii) How will you obtain  
1) Nylon 6:6  
2) Polyurethane. (4+4)  
(OR)
- b) i) Explain addition and condensation polymerization. Give atleast two examples each. (8)  
ii) What is Vulcanization ? How does Vulcanization improve the properties of rubber ? Discuss. (8)
13. a) i) Enumerate the factors influencing adsorption of gases on solids. (8)  
ii) Derive an expression for Langmuir adsorption isotherm. What are its limitations ? (8)  
(OR)
- b) i) Explain the role of Ni catalyst in the hydrogenation of ethylene. What is the role of promoters in catalysis ? (8)  
ii) Describe the process of treatment of effluent by activated sludge process. Give any four applications of activated carbon. (8)
14. a) i) Describe the principle behind the functioning of solar cell. (8)  
ii) Explain the construction of lead-acid battery. Write the discharging and charging reactions. (8)  
(OR)
- b) i) Describe the construction and working of  $H_2-O_2$  fuel cell. What are its applications ? (8)  
ii) Describe the functioning of lithium battery. (8)
15. a) i) What are refractories ? How are they classified ? Give essential requirements of good refractory material. (8)  
ii) Write notes on solid lubricants. (8)  
(OR)
- b) i) With neat sketch, explain the mechanism of lubrication. (8)  
ii) How are carbon nanotubes prepared ? Describe any two methods ? (8)
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