

PART B — (5 × 16 = 80 marks)

11. (a) (i) How will you determine hardness of water by EDTA method? Explain. (8)
(ii) Describe the process of demineralization of water. (8)

Or

- (b) (i) What do you understand by internal conditioning? Explain phosphate and calgon conditioning. (8)
(ii) With a neat diagram, explain reverse osmosis method of desalination. (8)

12. (a) (i) Write the mechanism of free radical polymerization. What are the monomers which can be polymerized by free radical polymerization? (10)
(ii) Write the differences between thermoplastics and thermosetting plastics. (6)

Or

- (b) (i) Write the preparation and uses of the following polymers.
(1) Polycarbonate
(2) Teflon. (8)
(ii) How are polymer matrix composites and fibre reinforced plastics made? (8)

13. (a) (i) Derive Langmuir adsorption isotherm. (8)
(ii) Discuss the various factors which affect the adsorption of a gas on solid adsorbent. (8)

Or

- (b) (i) Write briefly about the role of ion exchangers in pollution control. (8)
(ii) Write a note on the role of adsorbents in catalysis. (8)

14. (a) (i) What are nuclear chain reactions? Explain how the amount of nuclear energy can be improved. (8)
(ii) Explain the construction and working of a lead acid battery. (8)

Or

- (b) (i) What are fuel cells? Explain the construction and working of a fuel cell. (8)
(ii) State the principle and application of solar batteries. (8)

15. (a) Explain the following :
- (i) Natural and synthetic abrasives (8)
 - (ii) Refractories and their properties. (8)

Or

- (b) Write a note on the following :
- (i) Mechanism of lubrication (8)
 - (ii) Applications of nanomaterials. (8)
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