

Seventh Semester B. E. (Civil Engineering) Examination

ADVANCED WATER TREATMENT

Paper – 7 CE 05

(USC – 10217)

P. Pages : 3

Time : Three Hours]

[Max. Marks : 80

- Note :** (1) Separate answer book must be used for each section in the subject Geology, Engineering material of civil branch and Separate answer book must be used for Section A and B in Pharmacy and Cosmetic Tech.
- (2) All questions carry equal marks.
- (3) Answer **Three** questions from Section A and **Three** questions from Section B.
- (4) Due credit will be given to neatness and adequate dimensions.
- (5) Assume suitable data wherever necessary.

SECTION A

1. (a) Give the advantages of unit operation approach in water treatment process. 4
- (b) Write down the important unit operations employed in water treatment process. 4
- (c) What is the purpose of water treatment ? 5

OR

2. Explain the following with reference to aeration :—
- (i) Gravity aerator 4
- (ii) Spray aerators 4
- (iii) Governing factors. 5
3. (a) Explain zeta potential. 6
- (b) Describe factors affecting coagulation in brief. 7

OR

4. (a) A flocculator is to be designed for a 50 mld plant for velocity gradient of 40 sec. Calculate the area and side water depth of the flocculators and area of paddles. The temperature of water is 20°C for which $\mu = 1.002 \times 10^{-3}$ kg/ms. 8
- (b) Explain Pebbled bed flocculators. 5
5. (a) Write in detail about the inlet and outlet hydraulics of settling basin. 7
- (b) Explain in detail the "short - circuiting" in sedimentation basin. 7

OR

6. (a) State the design aspect of sedimentation basin. 7
- (b) Explain theory of : 7
- (i) Discrete settling
- (ii) Hindered settling.

SECTION B

7. (a) Give the guidelines for design of slow sand filters. 7
- (b) Explain types of filters and their classification. 7

OR

8. (a) Explain the hydraulics of filtration. 7
- (b) Explain upflow, biflow and dual media filters. 7
9. (a) What is disinfection ? Explain the objectives of disinfection. 7
- (b) Give the various forms of chlorine. 6

OR

10. (a) Explain in brief free available and combined available chlorine. 6

(b) What are the advantages and disadvantages of using ozone as a disinfectant? 7

11. (a) Explain zeolite process for removing permanent hardness. 6

(b) Explain lime-soda process for removing hardness. 7

OR

12. (a) Describe types of hardness and various methods of their removal. 6

(b) Explain fluoridation and defluoridation. 7



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