

III B. Tech II Semester Regular Examinations, April- 2016
ENVIRONMENTAL ENGINEERING – I
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

PART -A

- 1 a) Explain the factors affecting the design period. [5M]
- b) Write short notes on Mass curve analysis? [4M]
- c) Why turbidity in water is considered objectionable? [3M]
- d) Write short note on double filtration. [4M]
- e) What are the various forms of application of chlorine? [3M]
- f) What points are to be kept in view in the design of distribution system? [3M]

PART -B

- 2 a) What do you understand by 'per capita demand' of water? How is it determined? [5M]
- b) What per capita demand would you recommend for a small town with a population up to 2 lakhs? [4M]
- c) Explain in brief various factors that affect population growth. [7M]
- 3 a) What are the various sources of water used in water supply schemes? Discuss their merits and demerits from quality and quantity point of view. [10M]
- b) How do you differ the gravity and pressure conduits? [6M]
- 4 a) Describe in brief various important tests conducted for chemical examination of water. [8M]
- b) Write a note on coliform index. How do you determine it? [8M]
- 5 a) Draw a neat flow chart of water treatment plant and explain it. [12M]
- b) What is the principle of plain sedimentation? [4M]
- 6 a) Write a note on water softening accelerator. [4M]
- b) What is the underlying principle used in the aeration of water? What types of aerators are most commonly used? State the limitations of aeration unit operation. [12M]
- 7 a) What do you understand by an equivalent pipe? How do you determine its length when the pipes are (i) in series (ii) in parallel? [10M]
- b) Write short notes on scour valves and check valves. [6M]



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PART -A

- 1 a) Write about the importance and necessity of protected water supply systems. [4M]
- b) Differentiate clearly between gravity spring and Artesian spring. [4M]
- c) What is the importance under laying the determination of total solids in a water sample? [3M]
- d) What are the factors effecting sedimentation? [3M]
- e) Write a note on hypo chlorination. [3M]
- f) Write about the equivalent pipe methods. [5M]

PART -B

- 2 a) Explain in detail about water demands and its variations. [10M]
- b) Write a short note on population forecasting. [6M]
- 3 a) What are the factors governing the selection of the intake structure? [6M]
- b) Discuss the merits and demerits of different kinds of pipes. [10M]
- 4 a) Write a note on bacteriological analysis of water. [6M]
- b) Describe in brief various tests conducted for physical examination of water. [10M]
- 5 a) Explain the theory of filtration as used in the purification of water. [8M]
- b) What is the action of coagulants added to raw material? [8M]
- 6 a) What do you understand by chlorination? Explain its action in killing bacteria. [8M]
- b) Describe a simple process for carrying out deflouridation of water suitable for rural population of the country. [8M]
- 7 a) Discuss with the help of diagrams, various methods of laying out the distribution system. [10M]
- b) Write short notes on air values and check values. [6M]



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PART –A

- 1 a) What is the role of environmental engineer? [3M]
- b) Write short notes on infiltration gallery for a city water supply scheme. [4M]
- c) What is the principle involved in the determination of the p^H value of a sample? [3M]
- d) Write a short note on water Borne diseases. [5M]
- e) What do you understand by treatment of water? Why is it necessary? [3M]
- f) What is the difference between disinfection and sterilization? [4M]

PART –B

- 2 a) Mention the different methods of forecasting the future population of given town. Describe in detail. [10M]
- b) What per capita demand would you recommend for a large city with a population over 5 lakhs? Why? [6M]
- 3 a) Explain in detail about the various types of wells with the help of sketches. [10M]
- b) Discuss about the design aspects of pipe lines [6M]
- 4 a) Briefly describe the presumptive coliform rest carried out in routine analysis of water. [8M]
- b) Write a note on common impurities found in water. [8M]
- 5 a) Describe in brief various types of sedimentation tanks generally used. [8M]
- b) What is meant by coagulation? What are the common coagulants used? [8M]
- 6 a) Differentiate between the fluoridation and defluoridation. [8M]
- b) Name various disinfection methods and explain any one of them in detail. [8M]
- 7 a) Differentiate between Hardy cross and equivalent pipe methods. [8M]
- b) Write a short note on Sluice value and Air values. [8M]



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PART -A

- 1 a) Describe the role of various agencies in the planning and development of water supply. [4M]
- b) Differentiate between gravity well and pressure well. [4M]
- c) What is the most accurate method of determining hardness of a water sample? Discuss its importance. [4M]
- d) Differentiate between Stoke's law and Newton's law. [4M]
- e) What do you understand by break point chlorination? What are its advantages? [3M]
- f) Discuss about Hardy cross method. [3M]

PART -B

- 2 a) Explain in brief the factors affecting water demand. [6M]
- b) Write a short note on design period. [5M]
- c) Write a note on various water borne diseases. [5M]
- 3 a) What are the different kinds of pipes available for use in water supply system? Discuss their merits. [8M]
- b) Discuss in detail about the types of water bearing formations. [8M]
- 4 a) Differentiate between the B-Coli and E-Coli. [10M]
- b) What are the WHO guidelines for drinking water? [6M]
- 5 a) Describe various methods of application of coagulants. [8M]
- b) Describe with the help of sketches a slow sand filter. Explain its working. [8M]
- 6 Write short notes on the following:
 - a) Disinfection of water against viruses [4M]
 - b) Aeration [4M]
 - c) Ultra filtration [4M]
 - d) Softening of water. [4M]
- 7 Describe the various methods of distributing water and discuss the advantages and disadvantages of each. [16M]