

Code No: RT32011

R13**SET - 1**

III B. Tech II Semester Regular/Supplementary Examinations, April -2018
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) | What is meant by the term per capita demand? | [3M] |
| | b) | Differentiate between confined and unconfined aquifers. | [4M] |
| | c) | Define air valves. What is the purpose of providing air valves? | [4M] |
| | d) | Define specific conductivity of water. | [3M] |
| | e) | Define break point chlorination and double chlorination. | [4M] |
| | f) | What are the advantages of cast iron pipes? | [4M] |

PART -B

- | | | | |
|---|----|--|------|
| 2 | a) | Mention and discuss the factors that influence per capita demand. | [4M] |
| | b) | What do you understand by continuous and intermittent system of water supply? What are their relative advantages and disadvantages? | [8M] |
| | c) | Explain the importance and necessity for planned water supplies. | [4M] |
| 3 | a) | Define an intake structure. What are the factors governing the location of an intake? | [8M] |
| | b) | Explain about pipe appurtenances which are provided at various suitable places along the pipe lines. | [8M] |
| 4 | a) | What are the common impurities found in natural sources of water, and explain their effects up on its quality. | [8M] |
| | b) | Explain about IS (Indian Standard) drinking water quality standards and WHO guidelines for drinking water. | [8M] |
| 5 | a) | Explain about operation and cleaning of slow sand filters. | [8M] |
| | b) | Design six slow sand filter beds from the following data:
Population to be served = 50,000 persons.
Per capita demand = 150 lt/head/day.
Rate of filtration = 180 lt/hr/sq.m.
Length of each bed = Twice the breadth.
Assume maximum demand as 1.8 times the average daily demand. Also assume that one unit, out of six, will be kept as stand-by. | [8M] |
| 6 | a) | Explain about any three minor methods of disinfection. | [8M] |
| | b) | What are the various forms in which chlorine can be applied? Discuss. | [8M] |
| 7 | a) | Explain about grid iron system with neat sketch. | [8M] |
| | b) | Discuss about laying and testing of pipe lines. | [8M] |

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R13**SET - 2**

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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) What is the difference between arithmetic increase method and geometric increase method? [3M]
- b) What do you mean by perched aquifer? [4M]
- c) Define pressure relief valves. What is the purpose of providing pressure relief valves? [4M]
- d) Define BOD. [4M]
- e) Define super chlorination. [3M]
- f) What do you mean by socket and spigot joint? [4M]

PART -B

- 2 a) What are the factors governing the design period? [4M]
- b) Compute the population of the year 2000 and 2018 for a city whose population in the year 1930 was 25,000 and in the year 1970 was 47,000. Make use of geometric increase method. [8M]
- c) Explain about master plan method. [4M]
- 3 a) What are intake towers? Differentiate between dry and wet intake towers. [8M]
- b) Explain about the classification of river intake structures. [8M]
- 4 a) Explain about water borne diseases and their control. [8M]
- b) Explain about physical characteristics of water. [8M]
- 5 a) Explain about roughening and diatomaceous earth filters. [8M]
- b) Discuss about theory of filtration. [8M]
- 6 a) Explain about orthotolidine and D.P.D test. [8M]
- b) What are the methods of removing temporary hardness? Discuss in detail. [8M]
- 7 a) Explain about dead end system with neat sketch. [8M]
- b) What are the advantages and disadvantages of dead end system? [8M]

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R13**SET - 3**

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ENVIRONMENTAL ENGINEERING – I
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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) Write a short note on provision for fire demand in water supply. [3M]
- b) What is the difference between aquifuge and aquitard? [4M]
- c) Define check valves. [3M]
- d) What do you mean by water borne diseases? Mention the names of diseases that are caused by bacterial and protozoal infections. [4M]
- e) Define zeolite. [4M]
- f) What is the purpose of providing expansion joints? [4M]

PART –B

- 2 a) Discuss the logistic curve method for determining the future populations of a locality. Derive a standard equation for such a curve and explain its use for determining the future population. [8M]
- b) In two periods each of 20 years, a city has grown from 40,000 to 1, 60,000 and then 2, 80,000. Determine (i) saturation population (ii) equation of logistic curve and (iii) expected population after the next 15 years. [8M]
- 3 a) Give an equation defining Darcy's law. What is its limitation? [8M]
- b) What are infiltration galleries and infiltration wells? Explain both with neat sketches. Also define a ranney well. [8M]
- 4 a) How does water quality criteria differs for industrial supplies from those for domestic municipal supplies? [8M]
- b) Explain why bacteriological test should be necessary in handling problems of water supply. [8M]
- 5 a) Differentiate between slow sand and rapid gravity filters. [8M]
- b) What are the advantages and disadvantages of pressure filters? [8M]
- 6 a) Explain about lime – soda process for removing hardness. [8M]
- b) Explain about desalination by electrodialysis method. [8M]
- 7 a) Explain the Hardy cross method used for pipe network analysis in water distribution system. [8M]
- ~~b) What are the requirements of a good distribution system? [8M]~~

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R13**SET - 4****III B. Tech II Semester Regular/Supplementary Examinations, April -2018****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 compulsory3. Answer any **THREE** Questions from **Part-B**

PART –A

- 1 a) What is meant by coincident draft? [3M]
- b) Define cyclonic precipitation. [4M]
- c) Define turbidity. [3M]
- d) What are the maximum acceptable limits of [4M]
i)Turbidity ii)Fluorides iii)Nitrates and iv)Phenolic substances, in drinking water.
- e) Distinguish between slow sand and rapid sand filters with reference to method of [4M]
cleaning.
- f) Define flexible joint and flanged joint. [4M]

PART –B

- 2 a) Explain the different methods of forecasting future population of a city for which a [8M]
water supply scheme is to be planned.
- b) Given the following data, calculate the population at the end of next three decades [8M]
by decreasing rate method.

Year	Population
1940	80,000
1950	1,20,000
1960	1,68,000
1970	2,28,580

- 3 a) Enumerate the various surface sources of water, and discuss and compare the [8M]
quality and quantity of water supplies that may be available from these sources.
- b) What are the factors governing the selection of dam site. [8M]
- 4 Explain about chemical characteristics of water. [16M]
- 5 a) Explain about working and cleaning of rapid gravity filters. [8M]
- b) Discuss about operational troubles in rapid gravity filters. [8M]
- 6 a) Explain about zeolite process for removing hardness. [8M]
- b) What do you mean by desalination? Explain about desalination by reverse osmosis [8M]
process.
- 7 Explain about methods of distribution. Mention their advantages and [16M]
disadvantages.