III B. Tech II Semester Regular Examinations, April/May - 2019
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. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**

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PART –A

1.	a)	What do you understand by the term 'per capita demand'?	[2M]
	b)	Write a note on Quality of River water.	[2M]
	c)	Name the various tests that are carried out during the examination of the water before the treatment of water.	[2M]
	d)	Write a short note on handling and storing of Coagulants.	[3M]
	e)	Write a note on Break Point Chlorination.	[3M]
	f)	Explain Dead End or Tree system in water distribution system.	[2M]

PART –B

2.	a)	What are the various purposes for which provision should be made in the average daily per capita demand of water in a water supply scheme? Explain.	[7M]
	b)	The population of a locality as obtained from census report is as follows :	[7M]

Census year   2011   2001   1991   1981   1971
Population   2,76,000   4,12,000   9,40,000   15,06,000   15,69,000
Estimate the population of the locality in the year 2021 by using Incremental method.

3.	a)	Explain 'Mass – curve method for determination of storage capacity of a reservoir. What are its engineering uses?	[7M]
	b)	What are intakes? What point should be kept in mind while selecting a site for intake works?	[7M]
4.	a)	What are the common impurities mostly found in natural water? Explain their effect on the quality of water.	[7M]
	b)	Discuss the sources and impacts of tastes and odours in water supplies. Suggest control measures.	[7M]
5.	a)	What is the main process involved in Plain Sedimentation? Design the sedimentation tank of a water works to treat 12×10^6 litres of water per day. Assume the velocity of flow in the sedimentation tank as 20 cm/min and the detention period of 11 hours.	[7M]
	b)	With the help of a neat sketch describe a Pressure Filter.	[7M]
6.	a)	Explain briefly the following processes : (i). Super Chlorination (ii). De-chlorination	[7M]
	b)	Differentiate between temporary and permanent hardness. Mention any three methods of softening of water.	[7M]
7.	a)	What are the requirements of a good distribution system? Describe in brief various types of distribution systems.	[7M]
	b)	Explain the working of a Flush hydrant.	[7M]

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PART –A

1.	a)	What is meant by "design period" and "population forecasting"?	[2M]
	b)	Under what circumstances Impounding Reservoirs are constructed?	[2M]
	c)	What do you understand by "Wholesome Water"?	[2M]
	d)	Explain the theory of filtration as used in the purification of water.	[3M]
	e)	Write a note on Chlorine demand.	[3M]
	f)	Explain Grid Iron system in water distribution system.	[2M]

PART -B

2.	a)	What are the various factors which directly affect the per capita demand of a town? What do you understand by the term fluctuations in water demand?	[7M]
	b)	Population of a town as obtained from the Census reports is as follows :	[7M]

Year   1941   1951   1961   1971   1981   1991   2001
Population   24831   25293   25423   27263   38284   49909   63105
Estimate the population of the town in 2021.

3.	a)	What are the common sources of water for a water supply scheme? Distinguish between Surface water quality and Ground water quality.	[7M]
	b)	What are the various types of Intake works? Describe a River Intake with the help of a neat sketch.	[7M]
4.	a)	Discuss the sources and impacts of suspended solids. How are suspended solids measured?	[7M]
	b)	Give the permissible limits for the following in drinking water (i) Turbidity (ii) Chlorides (iii) Nitrates (iv) Hardness	[7M]
5.	a)	Explain the process of Sedimentation in the treatment of water. Discuss the difference between Plain Sedimentation and Coagulation.	[7M]
	b)	Explain the theory of Filtration as used in the purification of water. Sketch and describe an outlet for a Slow Sand Filter.	[7M]
6.	a)	What do you understand by the term 'disinfection of water'? What should be the requirements of good disinfectant?	[7M]
	b)	What do you understand "Hardness of water"? What trouble it may create if not removed?	[7M]
7.	a)	Write a note on the layout of distribution systems which are commonly used in India.	[7M]
	b)	Explain the working of a Check valve.	[7M]

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III B. Tech II Semester Regular Examinations, April/May - 2019
ENVIRONMENTAL ENGINEERING – I
(Civil Engineering)

Time: 3 hours

Max. Marks: 70

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2. Answer **ALL** the question in **Part-A**
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PART –A

1.	a)	Write a short note provision for "Fire Demand" in water supply.	[2M]
	b)	What factors should be considered while selecting site of an Impounding Reservoir?	[2M]
	c)	What is meant by 'pH' value? What is its importance in the water analysis?	[2M]
	d)	What is the main process involved in Plain Sedimentation?	[3M]
	e)	Write a note on Free Available Chlorine.	[3M]
	f)	Explain Circular or Ring system in water distribution system.	[2M]

PART -B

2. a) Why is population forecast necessary in the design of public water supply scheme? Explain. [7M]

b) Estimate the future population of a town in 2011. Given [7M]

Year	1951	1961	1971	1981	1991	2001
Population	3,50,000	4,66,000	9,95,000	15,60,000	16,30,000	18,40,000

Justify the method you have adopted.

3. a) Enumerate the various surface sources of water and discuss and compare the quality and quantity of water supplies that may be available from these sources. [7M]

b) With the help of a neat sketch explain Reservoir Intake. [7M]

4. a) What do you understand by Biological Examination of water? Why is it necessary and how is it done. [7M]

b) Write the standards for potable water for the following and discuss: [7M]
(i) pH   (ii) Fluorides   (iii) Iron and Manganese   (iv) Nitrates

5. a) How you will design a Continuous Flow Settling tank? What precautions you will take at the time of designing settling zone? [7M]

b) Explain the operation of a Rapid Sand Filter with the help of a neat sketch. [7M]

6. a) Explain different Chlorination practices adopted in water treatment. [7M]

b) Explain the removal of Iron and Manganese for the water treatment. [7M]

7. a) Write a note on various types of elevated reservoirs commonly used in water distribution system. [7M]

b) Explain the working of a Pressure relief valve. [7M]

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SET - 4

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2. Answer **ALL** the question in **Part-A**
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PART –A

1.	a)	Mention various types of water demand.	[2M]
	b)	Write a note on "Mass – curve method". What are its engineering uses?	[2M]
	c)	Write a note on Biological Analysis of water.	[2M]
	d)	What are the advantages of Plain Sedimentation?	[3M]
	e)	Write a note on Break Point Chlorination.	[3M]
	f)	Explain Radial system in water distribution system.	[2M]

PART -B

2.	a)	What do you understand by the term 'per capita demand'? In a town or city for what purposes generally water is required?	[7M]
	b)	The population statistics pertaining to a town are given below. Estimate the population expected in 2020 by Geometrical Increase method.	[7M]

Year   1960   1970   1980   1990   2000
Population   90,000   1,18,000   1,65,000   2,20,000   2,65,000

3.	a)	How the reservoir storage capacity is determined? Explain.	[7M]
	b)	With the help of a neat sketch explain Canal Intake.	[7M]
4.	a)	What are the sources and impacts of dissolved solids in water supplies? How are dissolved solids removed? How are TDS measurements expressed?	[7M]
	b)	Pathogens are not always bacteria. Name two Pathogenic bacteria, two Viruses and one Protozoan sometimes found in water sources.	[7M]
5.	a)	What is the necessity of using Coagulants in sedimentation? What are the various chemical coagulants which are commonly used in Coagulation process? How they remove suspended impurities.	[7M]
	b)	Explain the operation of a Slow Sand Filter with the help of neat sketch.	[7M]
6.	a)	Write briefly Carbonate and Non-carbonate hardness in water and their removal.	[7M]
	b)	What are the various methods which are commonly used for the removal of Colour, Odour and Taste from the water? Describe any one method in detail.	[7M]
7.	a)	Describe various types of distribution systems for water supply.	[7M]
	b)	Explain the working of a Sluice valve.	[7M]

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