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**

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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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Code No: RT32011 **R13** SET - 2

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**

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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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Code No: RT32011 **R13** SET - 3

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**

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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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Code No: RT32011 **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 compulsory
3. Answer any **THREE** Questions from **Part-B**

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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 i)Turbidity ii)Fluorides iii)Nitrates and iv)Phenolic substances, in drinking water.	[4M]
	e)	Distinguish between slow sand and rapid sand filters with reference to method of cleaning.	[4M]
	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 water supply scheme is to be planned.	[8M]
	b)	Given the following data, calculate the population at the end of next three decades by decreasing rate method.	[8M]

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 quality and quantity of water supplies that may be available from these sources.	[8M]
	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 process.	[8M]
7		Explain about methods of distribution. Mention their advantages and disadvantages.	[16M]

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