Total No. of Questions: 6 *Total No. of Printed Pages:3*

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

CE3EL01 Environmental Engineering

Programme: B.Tech. Branch/Specialisation: CE

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. A sewer is commonly design to attain- **1**
(a) Self-cleansing velocity (b) maximum velocity
(c) Both (a) and (b) (d) None of these

ii. Inverted siphon is used for- **1**
(a) Sewer crossing a river (b) Storm water regulations
(c) Maintenance of sewer (d) None of these

iii. Average temperature of sewage in India- **1**
(a) 20°C (b) 25°C (c) 30°C (d) None of these

iv. In the design of storm sewers, "time of concentration" is relevant to- **1**
(a) Velocity in the sewer (b) Rainfall Intensity
(c) Time of travel (d) Area served by the sewer

v. BOD Indicates- **1**
(a) Biological oxygen demand
(b) Biochemical oxygen demand
(c) Bio geo oxygen demand
(d) None of these

vi. What is SRT? **1**
(a) Surface retention time (b) Sludge retention time
(c) Solid retention time (d) None of these

vii. Oxidation pond- **1**
(a) Algae-bacteria symbiosis (b) Removes floating materials
(c) Both (a) and (b) (d) All of these

viii. What is detritus tank? **1**
(a) Removes silt and some organic matter
(b) Microorganism
(c) Removes floating materials
(d) None of these

ix. What is the unit of noise pollution? **1**
(a) Hertz (b) Decibel (c) Newton (d) None of these

x. Which of the following is called secondary air pollutant? **1**
(a) PANs (b) Ozone
(c) Carbon mono oxide (d) Nitrogen di oxide

Q.2 i. What is self-cleansing velocity? **2**

ii. Write about Separate and combined system of sewage collection. **3**

iii. Explain different types of shapes of sewer. **5**

OR iv. Explain hydraulic design of storm water. **5**

Q.3 i. Write in brief about manhole and street inlets. **2**

ii. Explain different types of sanitary fittings and appliances. **8**

OR iii. A 30 cm diameter sewer with invert slope of 1 in 500 in running full. Calculate the rate of flow in the sewer. Compare the velocity with self-cleansing velocity by Manning's formula. **8**

Q.4 i. Draw sewage treatment flow sheet. **3**

ii. Explain primary settling tank in detail. **7**

OR iii. Explain grit chambers and its working with design criteria. **7**

Q.5 i. What is sludge digestion? **2**

ii. Write about methods of disposal in brief. **3**

iii. Explain rapid and slow sand trickling filter with their difference and problems. **5**

OR iv. Explain activated sludge process in detail. **5**

Q.6 Attempt any two:

i. What is air pollution, it's sources and its effects? **5**

ii. Write about noise pollution with noise abatement and it's control. **5**

iii. Explain various methods of solid waste collection and disposal? **5**

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Scheme of Marking

Knowledge is Power	Faculty of Engineering End Sem (Odd) Examination Dec-2022 CE3EL01 Environmental Engineering
	Programme: B.Tech. | Branch/Specialisation:

Note: The Paper Setter should provide the answer wise splitting of the marks in the scheme below.

Q.1	i)	(A) Self-cleansing velocity	**1**
	ii)	(B) Storm Water Regulations	**1**
	iii)	(A) 20°C	**1**
	iv)	(C) time of travel	**1**
	v)	A) Biological oxygen demand	**1**
	vi)	C) Solid retention Time	**1**
	vii)	A) Algae-bacteria Symbiosis	**1**
	viii)	A) Removes silt and some organic matter	**1**
	ix)	B) Decibel	**1**
	x)	D) Nitrogen Di Oxide	**1**
Q.2	i.	2 Marks for correct definition	**2**
	ii.	1.5 marks each for both systems	**3**
	iii.	1 mark for each type (any 5)	**5**
OR	iv.	2 marks for description, 2 marks for data & 1 mark for diagram	**5**
Q.3	i.	1 mark for each inlet	**2**
	ii.	4 marks for fittings & 4 marks for appliances	**8**
OR	iii.	1 mark for data, 2 marks for formula & 5 marks for correct solution	**8**
Q.4	i.	3marks for flow chart	**3**
	ii.	4 marks for explanation & 3 marks for diagram	**7**
OR	iii.	2 marks for definition, 3 marks for working & 2 marks for design criteria	**7**
Q.5	i.	2 marks for definition	**2**
	ii.	1 mark for method name & 2 marks for explanation	**3**
	iii.	2.5 marks for each type	**5**
OR	iv.	2 marks for diagram & 3 marks for explanation	**5**
Q.6			
	i.	2 marks for definition, 1 mark for sources & 2 marks for effects	**5**
	ii.	2 marks for definition, 1 mark for abatement & 2 marks for control measures	**5**
	iii.	2.5 mark each for collection & disposal methods.	**5**

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