

Total No. of Questions: 6

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Enrollment No.....



Faculty of Engineering
End Sem (Even) Examination May-2022
CE3CO02 Water & Waste Water 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. The suitable method of forecasting population for an old developed large city, is- 1
(a) Arithmetic mean method (b) Geometric mean method
(c) Comparative graphical method (d) None of these
- ii. Which source of water among the following is not a surface source? 1
(a) River (b) Well (c) Lake (d) Ocean
- iii. A sudden change in the slope of hydraulic gradient line drawn for a straight section of a water pipeline indicates the- 1
(a) Change in ground slopes (b) Presence of water hammer
(c) Accumulation of sediments (d) Leakage in pipeline
- iv. The method which is most widely used for analysing and designing the pipes of all types of complex water distribution networks is- 1
(a) Equivalent pipe method (b) Hardy cross method
(c) Circle method (d) All of these
- v. Which of the following is not biodegradable organic matter? 1
(a) Carbohydrates (b) Fats (c) Alcohols (d) Petrol
- vi. Which of the following is the method of removal of Permanent Hardness? 1
(a) Boiling of water (b) Chlorination
(c) Lime soda Process (d) Use of Alum
- vii. The sewer pipes have to be designed and checked for- 1
(a) Only maximum flow
(b) Only minimum flow
(c) Both maximum and minimum flows
(d) None of these

P.T.O.

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- viii. The ventilation in sewers is needed to avoid the- **1**
 (a) Development of explosive mixtures of sewer gases
 (b) Build-up of odorous gases
 (c) Danger of asphyxiation of sewer maintenance employees
 (d) Anaerobic decomposition of organics
- ix. The dissolved oxygen sag curve manifests- **1**
 (a) BOD demand
 (b) BOD deficit
 (c) Variation of dissolved oxygen saturation
 (d) Dissolved oxygen deficit
- x. The measurement of non-biodegradable organic content is usually **1**
 carried out in terms of-
 (a) BOD (b) DO
 (c) TOC (d) COD
- Q.2 i. What do you mean by fire demand? **2**
 ii. What are confined and unconfined aquifer? Explain with the help of neat sketch. Derive an equation for determining the discharge from confined aquifer. **8**
- OR iii. The following is the population data of city available from past census records. Determine the population of the city in 2011 by **8**
 (a) Arithmetical increase method (b) Geometrical increase method

Year	Population
1931	12000
1941	16500
1951	26800
1961	41500
1971	57500
1981	68000
1991	74100

- Q.3 i. Enlist the various layout of distribution network of water supply. **2**
 ii. Briefly explain any three methods of detecting the leakages in pipe. **3**
 iii. What are the various types of valves and pipes used in conveying water in water supply scheme? **5**

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- OR iv. What are various types of Intake structures? Describe a Reservoir Intake with the help of neat sketch. **5**
- Q.4 i. Explain Breakpoint Chlorination. **3**
 ii. Describe in brief the various physical and chemical characteristics of water with their permissible limit as per drinking water standards. **7**
- OR iii. Discuss how slow sand filter differ from rapid sand filter. **7**
- Q.5 i. Explain briefly **4**
 (a) Manhole (b) Conservancy system
 (c) Storm Water (d) Flushing tanks
- ii. Discuss the comparative merits and demerits of the separate system and combined system of sewerage **6**
- OR iii. Explain about the design of sewers. **6**
- Q.6 Attempt any two:
 i. Write short note on “Self-purification capacity of Stream”. **5**
 ii. What is land treatment? Discuss the condition under which it is suitable. **5**
 iii. Describe the BOD of sewage with influencing parameters. Calculate the 1-day 37° BOD of sample whose 5-day 20° BOD is 100mg/lit. **5**

Marking Scheme

CE3CO02 Water & Waste Water Engineering

Q.1	i.	The suitable method of forecasting population for an old developed large city, is-	1
		(a) Arithmetic mean method	
	ii.	Which source of water among the following is not a surface source?	1
		(b) Well	
	iii.	A sudden change in the slope of hydraulic gradient line drawn for a straight section of a water pipeline indicates the-	1
		(d) Leakage in pipeline	
	iv.	The method which is most widely used for analysing and designing the pipes of all types of complex water distribution networks is-	1
		(b) Hardy cross method	
	v.	Which of the following is not biodegradable organic matter?	1
		(d) Petrol	
	vi.	Which of the following is the method of removal of Permanent Hardness?	1
		(c) Lime soda Process	
	vii.	The sewer pipes have to be designed and checked for-	1
		(c) Both maximum and minimum flows	
	viii.	The ventilation in sewers is needed to avoid the-	1
		(a) Development of explosive mixtures of sewer gases	
	ix.	The dissolved oxygen sag curve manifests-	1
		(d) Dissolved oxygen deficit	
	x.	The measurement of non-biodegradable organic content is usually carried out in terms of-	1
		(d) COD	
Q.2	i.	Correct explanation	2
	ii.	Definition	2
		(1 Mark*2)	
		Neat sketch	2
		Correct derivation	4
OR	iii.	As per the solution	8
Q.3	i.	Correct layout	2
	ii.	Explanation of each method (3 methods)	3
		(1 Mark*3)	

	iii.	Types of valves	2 Marks	5
		Types of pipes	2 Marks	
		Diagram	1 Mark	
OR	iv.	Types of Intake structures	2 Marks	5
		Reservoir Intake	2 Marks	
		Diagram	1 Mark	
Q.4	i.	Correct explanation	2 Marks	3
		Diagram	1 Mark	
	ii.	Physical characteristics	3 Marks	7
		Chemical characteristics	4 Marks	
OR	iii.	For each correct difference	1 Mark each	7
		(1 Mark*7)		
Q.5	i.	(a) Manhole	1 Mark	4
		(b) Conservancy system	1 Mark	
		(c) Storm Water	1 Mark	
		(d) Flushing tanks	1 Mark	
	ii.	For each correct merit or demerit	0.5 Mark each	6
		(0.5 Mark*12)		
OR	iii.	Correct explanation	6 Marks	6
Q.6		Attempt any two:		
	i.	Correct explanation (accordingly)	5 Marks	5
	ii.	Definition	2 Marks	5
		Condition for land treatments	3 Marks	
	iii.	As per the solution	5 Marks	5
