University of Mumbai
Examination May2022

Examinations Commencing from 17 May 2022

Program: **___Civil Engineering**

Curriculum Scheme: Rev - 2019

Examination: TE Semester: VI

Course Code: CEC604 Course Name: Environmental Engineering

Time: 2hour 30 minutes Max. Marks: 80

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170522_R19_TE_VI_CEC604_QP1

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Q1.	**Choose the correct option for following questions. All the Questions are compulsory and carry equal marks**
1.	water can be easily diverted for fire fighting in this system
Option A:	Grid iron system
Option B:	Dead end system
Option C:	Radial system
Option D:	Gravity system
2.	Within first five days BOD demand get satisfied by
Option A:	48%
Option B:	58%
Option C:	78%
Option D:	68%
3.	Which water treatment process is done after filtration of water?
Option A:	Primary sedimentation
Option B:	Secondary sedimentation
Option C:	Disinfection
Option D:	Flocculation
4.	Which of the following is the basic indicator of river health
Option A:	BOD
Option B:	COD
Option C:	DO
Option D:	ThOD
5.	In which type of aerator, the flow of water is divided into fine streams and small droplets.
Option A:	Spray aerator
Option B:	Cascade aerator
Option C:	Inclined apron aerator
Option D:	Gravel bed aerator

6.	A right angle sleeve made of brass and gun metal is called
Option A:	Goose neck
Option B:	Ferrule
Option C:	Service pipe
Option D:	Stop cock
7.	What indicates the permanent hardness when alum is added to water
Option A:	$Al(OH)_3$
Option B:	$Ca\ SO_4$
Option C:	CO_2
Option D:	$Ca(OH)_2$
8.	Aeration is not required in this sewage processing unit
Option A:	Trickling filter
Option B:	Oxidation pond
Option C:	Activated sludge process
Option D:	Septic tank
9.	Which of the following is called secondary air pollutant
Option A:	PANs
Option B:	Carbon dioxide
Option C:	Carbon monoxide
Option D:	Nitrogen dioxide
10.	This is a suitable method of disposal of solid waste containing organic waste
Option A:	Incineration
Option B:	Landfilling
Option C:	Composting
Option D:	Chemical precipitation

Attempt any three questions out of following

Q2 (A)	**Solve any two out of three** **5 marks each**
1	*Explain the factors affecting the location of intake structure*
2	*Explain the mechanism of coagulation and flocculation*
3	*Determine the velocity and rate flow of sewage flowing through the sewer of diameter 300mm and running half full. Sewer is laid at the gradient of 1in 300. Take Manning's constant N=0.013*
Q2 (B)	**Solve any one of the following** **10 marks each**
1	*Design the rapid sand filter with under drainage system to treat 7.5MLD Of raw water. Assume rate of filtration 6000 lit/hr/m^2, assume 5% water and 30 minutes required for back washing.*
2	*Following is the data for the single stage trickling filter a)Sewage flow= 4.5MLD b) BOD5 of raw sewage= 250mg/l*

	c)recirculation ratio=2 d)depth of media=2M e)BOD of effluent=25mg/l f) BOD removal in primary tank = 30% Determine size of single stage trickling filter and find out efficiency.
Q3 (A)	**Solve any Four Questions out of six 5 marks each**
1	*Write down the effect of air pollution on human health*
2	*Show that 70dB + 70dB ≠ 140dB*
3	*Explain in detail self-purification capacity of stream*
4	*Explain functional elements of solid waste management*
5	*Explain the process of break point chlorination*
6	*.Explain different methods of water softening.*
Q4 (A)	**Solve any Two Questions out of Three 5 marks each**
1	*Differentiate between one pipe and two pipe system*
2	*Chlorine usage in treatment of 20 MLD of water is 16Kg/day. The residual After 10 minute of contact is 0.2 mg/l. Calculate chlorine dosage in mg/l and chlorine demand of water.*
3	*A sewage sample has 5 day BOD of 180 mg/l at 20^0C. calculate the 2 day BOD of the sample at 37^0C . Take K_D=0.1*
B	***Solve any one of the following 10 marks each***
1	*Design a Septic tank for housing colony of 200 people, water supply rate is 150l/c/day and tank is to be clean once in two years. Draw the sectional sketch showing all the details.*
2	*Design the sedimentation tank to treat 10 MLD of raw water. Assume flow velocity 0.25m/minute, overflow rate 600 lit/hr./m^2 and detention time of 4hour.*