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Code No: 156AX

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech III Year II Semester Examinations, July - 2023

ENVIRONMENTAL ENGINEERING

(Civil Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	What is the IS code referred for potable water quality for drinking?	[2]
b)	Draw the sketch of an infiltration gallery.	[3]
c)	Define surface overflow rate.	[2]
d)	What is meant by cracking of filters?	[3]
e)	Define BOD of wastewater.	[2]
f)	Write the disposal standards for treated wastewater on land and sea.	[3]
g)	What is the role of the absorption pit in a septic tank?	[2]
h)	What is the role of flushing tanks in sewerage systems?	[3]
i)	What is meant by Environmental Lapse Rate?	[2]
j)	What is an atmospheric inversion?	[3]

PART – B

(50 Marks)

2.a) What are the factors affecting water demand?
b) List various water quality parameters that are to be considered while planning water supply systems. [5+5]

OR

3.a) What are the most common water borne deceases? Write the measures to control.
b) Write the importance of fire demand in the planning of water supply projects? Explain any two methods. [5+5]

4.a) Draw a layout plan for a typical drinking water supply treatment system. Name the component parts and mention uses of each.
b) Determine the quantity of alum required to treat 15 MLD of water having a demand of 12 ppm. [5+5]

OR

5.a) In a continuous flow settling tank, 3.5 m deep and 65 m long, the flow velocity is observed to be 1.25 cm/s. Estimate the minimum size of particles of relative density 2.65 that may effectively removed in this tank.
b) Explain various layouts of water distribution networks with their sketches. [5+5]

6.a) Explain Carbonaceous and Nitrogenous BOD with the help of curve for a domestic wastewater.

b) Explain the importance of self-cleaning and non-scouring velocity in the design of sewers. [5+5]

OR

7.a) Check for the self-cleaning velocity of a circular sewer having a diameter of 1.2 m laid at a gradient of 1 in 550 running partially 0.6 depth. Take Manning's 'n' as 0.012.

b) The 7 days BOD of a sample of sewage is 300 ppm at 20 ^{0}C and its 3 days BOD is 500 ppm at 37 ^{0}C. Find the value of deoxygenation coefficient and estimate 5 days BOD at 30 ^{0}C. [5+5]

8.a) Distinguish between primary and secondary treatment of sewage.

b) Draw the flow diagram for the sewage treatment using activated sludge process. [5+5]

OR

9. Calculate the volume and number of aeration tanks and the rate of air supply for the following data of the activated sludge unit:

Population	: 35, 000
Average sewage flow	: 150 lpcd
BOD of raw sewage	: 200 mg/l
BOD removed in primary treatment	: 30%
Overall BOD reduction desired	: 90%

[10]

10. Explain the Gaussian plume model applied to predict the dispersion of air pollutants. Write the limitations of the model. [10]

OR

11. How do you control the gaseous pollutants from industries? Explain any 2 methods with the help of a neat sketch. [10]

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