SRINIX COLLEGE OF ENGINEERING

2nd INTERNAL EXAMINATION-2021-22

Subject-WWWE

Semester-5TH

Branch-CE

Full Mark-100

Time-2.30Hrs

PART-A

ANSWER ALL THE QUESTIONS

- **1. a)** Define per capita demand.
 - **b**) What is coincident Draft?
 - c) List the factors that govern the selection of a site for intake structure.
 - d) For the same solid content, if the quantity of sludge with moisture content of 98%

[2X10]

- is V, then what will be the quantity of sludge with moisture content of 96%.
- e) What is schmutzdecke or dirty skin?

f) Define time of concentration.

g) What are the components of sedimentation aided with coagulation?

h) What do you mean by specific yield and specific retention? Write the relation between them with respect to the porosity.

i) State the importance of recirculation in Activated Sludge Process.

j) Write down the formula for the calculation of hardness.

PART-B

Short Answer Type Question

ANSWER ANY EIGHT [8×6]

2. a) Explain with neat sketch the working principle of trickling filter.

b) Write a short note on oxidation pond.

c) Explain the factors affecting the sludge digestion process.

d) Explain the steps involved in the sewage treatment.

e)2.5 ml of raw sewage has been diluted to 250nml & the D.O. concentration of the diluted sample at the beginning of the BOD test was 8mg/l and 5mg/l after 5 days incubation at 20°C. Determine the BOD of raw sewage.

f) If a 3 day BOD of sewage at 20°C is 400 mg/l. Find its 5 day BOD at 20°C? Assume value of $K_{20}=0.1/day$.

g) What are the requirements of a good distribution system? Discuss

with neat sketches the various types of layout of distribution systems.

h) To treat 4.54 Mld water, bleaching powder containing 30% chlorine is

used. A dose of 0.4 mg/l of chlorine is used to maintain a residual of 0.1

mg/l . Compute amount of bleaching powder necessary.

i) Calculate the ratio of discharge of a sewer when flowing at full depth to that of when flowing at half depth.

PART-C

Long answer type questions

ANSWER ANY TWO

3. An average operating data for conventional activated sludge treatment plant is as follows,

Waste water flow= 35000m3/day

Volume of aeration tank=10900 m3

Influent BOD=250mg/l

Effluent BOD=20 mg/l

MLSS=2500nmg/l

Effluent suspended solids= 30 mg/l

Waste sludge suspended solids=9700mg/l

Quantity of waste sludge =220m3/day

Based on above information determine

- a) Aeration period
- b) F/M ratio
- c) % efficiency of BOD removal
- d) Sludge age (days)
- **4.** a) What do you mean by "Self Purification" of stream? Draw a neat sketch of an oxygen sag curve and explain the salient features.

b) Bring out the difference between self cleansing velocity and non-scouring velocity.

A 30 cm diameter sewer having an invert slope of 1 in 150 was flowing full. What would be the velocity of flow and discharge? (n=0.013). What would be the velocity and discharge when the same is flowing at 0.20 and 0.8 of the full depth.

5. a) Define and differentiate between suspended and attached growth process.
b) Design a high rate trickling filter from the following data: Design flow: 60 Ml/d Recirculation ratio: 1:2 BOD of primary treated sewage: 270 mg/l Desirable effluent BOD: 20 mg/l