

Marks- 80

Duration- 3 Hrs.

- N.B.:
- 1) Question number one is compulsory.
  - 2) Attempt any three of remaining five questions.
  - 3) Assume suitable data if required.
  - 4) Draw neat sketches wherever necessary.

Q.1. Solve any four of the following: (20)

- A) What is Sludge Volume Index? What is its significance?
- B) Differentiate between conservancy system & water carriage system
- C) Explain with neat sketch Drop manhole
- D) Give the differences between aerobic and anaerobic processes
- E) State the routine tests carried out in the laboratories at sewage treatment explaining their significance.

Q.2. A) Design the dimensions of a septic tank for a colony of 170 persons provided with (10)  
an assured water supply from the municipal head-works at a rate of 135 liters per person per day. Assume any data if required.

B) Explain Process mechanism of ASP with neat sketch (10)

Q.3. A) The 6 day 30°C BOD of a sewage sample is 150 mg/lit. (10)

Calculate its 5 day 20°C BOD. Assume  $k_{20}=0.10$  per day.

B) What is meant by self purification of streams? Explain the zones of pollution with a neat a sketch. (10)

Q.4. A) Enlist and explain different methods which can be used for disposal of municipal (10)  
Solid waste.

B) Determine the size of high rate trickling filter for following data: (10)

I) Flow = 5 MLD

II) BOD<sub>5</sub> of raw sewage = 300 mg/lit

III) Recirculation ratio = 1.4

IV) BOD removed in primary Clarifier = 25%

V) Final effluent BOD desired = 40 mg/lit

Q.5. A) Calculate the discharge of 1.0 m circular sewer laid at a slope of 1 in 500, (10)

When it is running half full. Assume  $n$  in Manning's formula as 0.011.

B) Enlist the various plumbing systems and explain any two in detail with well labeled diagrams. (10)

Q.6. Write short note on (any four) (20)

A) Constructed wetlands

B) Anti siphonage pipe

C) Recycle and reuse of waste water

D) Oxidation pond

E) Characteristics of Hazardous waste

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