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10CV71

Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020
Environmental Engineering II

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO full questions from each part.

PART - A

- 1 a. Define the following terms:
i) Garbage
ii) Sub soil water
iii) Sullage
iv) Out fall sewer
v) Sewerage
vi) Rubbish. (06 Marks)
- b. Briefly explain the following:
i) Time of concentration
ii) Factors affecting dry weather flow. (08 Marks)
- c. Design the section of a combined circular sewer from the following data:
Area to be served = 150 hectares
Population of the locality = 50,000
Maximum permissible velocity = 3.2m/sec
Time of entry = 5 minutes
Time of flow = 20 minutes
Rate of water supply = 270 litres/capita/day Impermeability factor = 0.45
$$i = \frac{760}{t + 20}$$
 (06 Marks)
- 2 a. Enumerate the points to be considered while selection of sewer materials. (08 Marks)
b. Briefly discuss the different test conducted on sewer lines. (06 Marks)
c. Calculate the diameter and discharge of a circular sewer laid at a slope of 1 in 500 when running half full and with a velocity of 2 m/sec. Take $N = 0.012$ in Manning's formula. (06 Marks)
- 3 a. Briefly discuss the points to be considered for membrane of house drainage. (06 Marks)
b. Why is it necessary to provide sewer appurtenances on the sewer line? With the help of neat sketch explain drop manhole. (08 Marks)
c. What are traps? With the help of neat sketch, explain different types of traps classified based on their shapes. (06 Marks)
- 4 a. What is sampling? Explain different types of sampling. (06 Marks)
b. What is the importance of BOD test? Explain with the help of neat sketch. First and second stage BOD. (08 Marks)
c. If the 3 days 25°C BOD of a sample of sewage is 250 mg/l. What will be its 5 day 30°C BOD? (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

**PART - B**

- 5 a. What is sewage forming? Explain different methods of sewage applied to land. (08 Marks)
b. What do you understand by self-purification of a stream? Explain the factors affecting the self purification of stream. (06 Marks)
c. The sewage of a town is being discharged into a river. The quantity of sewage is 5MLD and its BOD is 300mg/L. If the flow of the river is 100lit/sec and if BOD of river water is 7mg/L
i) Find the BOD of the diluted sewage.
ii) What should be the discharge of river if it is desired to reduce the BOD of the mixture to 30mg/L.? (06 Marks)
- 6 a. Draw the flow diagram of municipal waste water treatment and highlight the important operation. (08 Marks)
b. Design a circular sewage sedimentation tank for a town having population of 40,000. The average water demand is 140 litres/capita/day. Assume that 70% water reaches at the treatment unit and the maximum demand is 2.7 times the average demand. (08 Marks)
c. What is the purpose of screening? How the disposal of screening is done. (04 Marks)
- 7 a. Enumerate various types of activated sludge process. Explain any two methods in brief. (08 Marks)
b. Explain with the help of neat sketch the working of a conventional trickling filter. (08 Marks)
c. Define sludge volume index. Write the importance of sludge volume index. (04 Marks)
- 8 Briefly explain the following:
a. Oxidation pond
b. Septic tank
c. Sludge drying beds
d. Reuse of waste water. (20 Marks)
