Dr Sarpal Singh Kaloch 9/5/2023

Roll Number_____ 197

National Institute of Technology, Hamirpur HP

Name of the Examination: B.Tech. (Civil Engineering) May 2023.

Branch : Civil Engineering. Semester : VI.

Course Name : Wastewater Treatment and Management. Course Code : CE – 324.

Time: Three Hours. Maximum Marks: 50.

Note: ***Attempt all the questions. Assume suitably the missing/ additional data.***

1.(a).In terms of sewage treatment indicate the functions performed by flow equalization. What benefits are derived from flow equalization? (5)

(b).Discuss the several sewer appurtenances for diverting part of the storm water flow away from sewers during severe storms. Draw illustrative sketches. (5)

2.(a).State important physical and chemical laboratory tests that are carried out to know the characteristics of sanitary sewage. (5)

(b). For a sample of sewage, 5-day BOD at 20°C is 250 mg/L and it is 67% of the ultimate BOD. What will be its 4-day BOD at 30°C? (5)

3.(a).Explain briefly the principles of working of aerobic, anaerobic and facultative type of stabilization ponds. (5)

(b).In a continuous flow settling tank, 3.5 m deep and 65 m long, if the flow velocity of sewage observed as 1.22 cm/s, what size of particles of specific gravity 2.65 may be effectively removed? Assume temperature 25°C and kinematic viscosity of water as 0.01 cm^2/s. (5)

4.(a).Draw a neat sketch showing water and sanitary fittings required for a building, and prepare a list of plumbing materials. (5)

(b).Design sludge drying beds for digested sludge obtained from low rate anaerobic digesters for digesting a mixture of primary and excess activated sludge. The capacity of the activated sludge plant is 50,000 m^3/d, volume of digested sludge is 229 m^3/d, and sewage flow may be assumed as 180 litres per capita per day. (5)

5.(a).Write a note on characteristics of industrial sewage. Discuss briefly the various processes adopted for the treatment of industrial sewage. (5)

(b).Explain the difference between the dilution process, if the wastewater effluents are disposed off in stream water and sea water. (5)