**Registration No.** | | | | | | | | | | |

**Total Number of Pages:02** **B.Tech**
**PCI5I103**

**5th Semester Regular / Back Examination 2019-20**
**WATER SUPPLY AND SANITARY ENGINEERING**
**BRAMCH:CIVIL**
**Max Marks: 100**
**Time: 3 Hours**
**Q Code: HRB223**

**Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.**
**The figures in the right hand margin indicate marks.**

**Part- I**

**Q1** **Only Short Answer Type Questions (Answer All-10)** **(02x10)**

**a)** Write the basic categories of purposes of water demand.
**b)** What is pH value and pH scale?
**c)** How is the B-coli index determined?
**d)** Define Hydraulic subsidence. State the factors those oppose the settlement of particles in a tank.
**e)** Write the efficiency of rapid sand filter considering bacterial load and turbidity.
**f)** How do you differentiate Plain Chlorination and Pre-Chlorination?
**g)** How does the Fan pattern of refuse collection function?
**h)** Why do you need a grit chamber in primary waste water treatment system?
**i)** What is a skimming tank?
**j)** Define sludge dewatering.

**Part- II**

**Q2** **Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve)** **(06x08)**

**a)** Give an idea for the water requirements for buildings other than residences.
**b)** Find out the head loss due to friction in a rising main from the following data:
Friction factor = 0.025, Discharge to be pumped=1500 litres per minute, length of rising main=500 m, Diameter of the pipe = 0.20m.
**c)** Illustrate the requirements of portable or wholesome water.
**d)** In a water treatment plant, the pH values of entering and leaving waters are respectively 7.5 and 8.5. Assuming linear variation of pH with time, find out the average pH value of water.
**e)** A settling tank is designed to remove spherical particles of 0.80 mm diameter with specific gravity 1.20 from the water at 22° C. Determine the removal of spherical discrete particles of 0.40 mm diameter with specific gravity 1.20 by this tank. Assume ideal settling conditions.
**f)** Discuss in detail the slow sand filters with reference to their essential parts, working and cleaning, rate of filtration and efficiency.
**g)** A town having population of about 50,000 is to be supplied water at the rate of 150 litres per capita per day. The disinfection of water is to be carried out with bleaching powder containing 30 per cent of active chlorine. If the chlorine dose required for infection is 0.3 ppm or 0.3mg/l, calculate the quantity of bleaching powder per year.
**h)** Classify the systems of sewerage. Illustrate their advantages and disadvantages.
**i)** List all the required units for a typical waste water treatment plan.

**j)** Discuss the types of ‘Screens’ used in case of primary treatment of sewage.
**k)** What are the design aspects of trickling filters?
**l)** Discuss the factors those affect sludge digestion.

## Part-III

**Only Long Answer Type Questions (Answer Any Two out of Four)** **(02X16)**

**Q3** Discuss the design aspects of continuous flow type sedimentation tank.
**Q4** Classify and describe the methods of layout of water distribution pipes.
**Q5** Enumerate the favourable conditions for sewerage.
**Q6** Design a detritus tank for an average flow of 200 litres per second. Make suitable assumptions, where necessary.