Registration No. : | | | | | | | | | | |

*Total number of printed pages – 2*

B. Tech

PCCI 4402

# Seventh Semester Back Examination – 2014

## WATER SUPPLY AND SANITARY ENGINEERING

## BRANCH : CIVIL

### QUESTION CODE : L 207

**Full Marks – 70**

**Time : 3 Hours**



*Answer Question No. **1** which is compulsory and any **five** from the rest.*
*The figures in the right-hand margin indicate marks.*

1. Answer the following questions : 2×10

   (a) Define a perched aquifer with a neat sketch.

   (b) Define coefficient of permeability and coefficient of transmissibility.

   (c) Why is it necessary to lay pipes in parallel ?

   (d) Write Hazen William formula for head loss in pressure pipes.

   (e) Define cone of depression and radius of influence.

   (f) Define per capita water demand.

   (g) Define sewage and sewerage.

   (h) Differentiate between suspended growth system and attached growth system.

   (i) What is the function of a water distribution system ?

   (j) Define the alkalinity of a water sample. What are its possible sources ?

2. (a) Briefly discuss the recuperating test for calculating the yield of an open well. 5

(b) A 50 cm diameter well penetrates 30 m below the static watertable. After 24 hours of pumping @ 5100 liters/minute, the water level in a test well at 75 m is lowered by 0.61 m, and in a well 30 m away the drawdown is 0.95 m

(i) What is the transmissibility of the aquifer ?

(ii) Also determine the drawdown in the main well. 5

3. Briefly discuss about the theory of sedimentation. Discuss the design concepts of a plain sedimentation tank. 10

4. (a) Give a brief account of various water demands. 5

(b) Briefly discuss the factors affecting per capita water demand. 5

5. (a) Briefly discuss about the pressure conduits. 5

(b) Water has to be supplied to a town with one lakh population at the rate of 150 lpcd from a river, 1.8 km away. The difference in elevation between the lowest water level in the sump and the service reservoir is 36 meters. Determine the size of the main and horse power of the pump required. Assume suitable data wherever necessary. 5

6. (a) Deduce an expression for BOD with time. 5

(b) Calculate 3 day 35° C BOD of sewage sample whose 5 day 20° C BOD is 200 mg/L. Assume $K_D$ at 20° C as 0.1. 5

7. (a) Briefly discuss about the disinfecting action of chlorine. 5

(b) Discuss about break point chlorination. 5

8. Write short notes on any **two** of the following : 5×2

(a) Ground water sources

(b) Aquifers

(c) Septic tank

(d) Intake.