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Total Number of Pages: 2

B.TECH
PCC14402

7th Semester Regular / Back Examination 2015-16
WATER SUPPLY AND SANITARY ENGINEERING

BRANCH: CIVIL

Time: 3 Hours

Max marks: 70

Q.CODE: T702

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

Q1 Answer the following questions: **(2 x 10)**

- a) Define per capita water demand. How is it calculated?
- b) Show that depth has no role in the design of a sedimentation tank.
- c) Give the factor affecting population growth rate.
- d) What is schmutzdecke?
- e) Name different sub-surface sources of water.
- f) What is time of concentration?
- g) Why a sewer is designed as a gravity pipe?
- h) What are the advantages of providing pipes in parallel?
- i) What is cavity formation in wells?
- j) Name the different layouts of distribution networks.

Q2 a) Briefly discuss about the various water demands considered while designing a water supply scheme. **(5)**

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

Q3 a) Briefly discuss about the arithmetic increase and geometric increase method of population forecasting. **(5)**

b) The populations in 5 decades from 1940 to 1980 are given below. Find out the population in 2000, 2015 and 2021 using arithmetic increase and geometric increase method. **(5)**

year	1940	1950	1960	1970	1980
population	27,000	31,000	38,000	45,000	50,000

Q4 Briefly discuss about the design concepts of a horizontal flow sedimentation tank. Two primary settling basins are 25 m in diameter **(10)**

with a side water depth of 2.5 m. A single effluent weir is located on the circumference of the basin. For a water flow of 24,000 m³/d, calculate:

- (i) Surface area and volume of the basin;
- (ii) SOR in m³/m²/d;
- (iii) Detention time in hours;
- (iv) Weir loading in m³/m/d.

- Q5** a) Briefly discuss about pumping test and recuperation test for yield of an open well. (5)
- b) A 40 cm diameter well penetrates 30m below the static water table. After 24 hours of pumping @ 5000 L/minute, the water level in a test well at 80 m is lowered by 0.55 m, and in a well 40 m away the drawdown is 1.15 m. (a) What is the coefficient of transmissibility of the aquifer? (b) Also determine the drawdown in the main well. (5)
- Q6** a) Briefly discuss about the theories behind filtration. (5)
- b) Discuss the construction of a slow sand filter with a neat sketch. (5)
- Q7** a) Briefly discuss about the disinfecting action of chlorine. (5)
- b) What is break point chlorination? Give a brief account of it. (5)
- Q8** Write short notes on any two: (5 x 2)
- a) Twin well intake
- b) Physical characteristics of water
- c) Alum as coagulant
- d) Activated sludge process