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

Total Number of Pages: 02 **B.Tech**
PCCI4402

7th Semester Regular/Back Examination 2017-18
Water Supply and Sanitary Engineering
BRANCH : CIVIL
Time: 3 Hours
Max Marks: 70
Q.CODE: B221
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 demand*.
b) What is *Coincident Draft*?
c) List the factors that govern the selection of a site for intake structure.
d) For the same solid content, if the quantity of sludge with moisture content of 98% is V, then what will be the quantity of sludge with moisture content of 96%?
e) What is dirty skin?
f) Define Time of Concentration.
g) Explain Perched Aquifer with a neat sketch.
h) What are the components of *sedimentation aided with coagulation*?
i) What do you mean by specific yield and specific retention? Write the relation between them wrt the porosity.
j) State the importance of recirculation in "Activated Sludge Process".

Q2 **a)** A 40 cm diameter well penetrates 30m below the static water table. After 24 hours of pumping @ 6000 L/min, the water level in a test well at 90 m is lowered by 0.64m and in a well 35 m away the drawdown is 1.11m. What is the transmissibility of the aquifer? Also determine the drawdown in the main well. **(6)**

b) What considerations govern the choice of particular type of pump in water supply engineering? **(4)**

Q3 **a)** In a continuous flow settling tank 3m deep and 60m long, what flow velocity of water would you recommend for effective removal of 0.025 mm particles at 25 ^{0}C. the specific gravity of particles is 2.65 and kinematic viscosity of water is taken as 0.01cm^2/sec. **(5)**

b) Discuss about the disinfecting action of chlorine and break-point chlorination. **(5)**

Q4 **a)** Discuss the merits and demerits of Slow Sand Filter and Rapid Gravity Filter. **(4)**

b) A filter unit is 4.5m by 9.0m. After filtering 10,000 cubic meter per day in 24 hours period, the filter is backwashed at a rate of 10 l/sq. m/sec. for 15 min. Compute the average filtration rate, quantity, percentage of treated water used in washing and the rate of wash water trough in each trough. Assume 4 troughs. **(6)**

Q5 **a)** Mention any three methods of *softening* of water. Describe zeolite process of softening of water in detail. **(5)**

b) Differentiate between *separate system* and *combined system* of sewerage. **(5)**

Q6 **a)** Explain with neat sketch the working principle of *trickling filter*. **(5)**

b) Calculate the velocity of flow and corresponding discharge in a sewer of circular cross section with diameter of 1 m, laid in a gradient of 1 in 500. The sewer runs at 0.6 times depth. Use Manning's formula considering k= 0.012 . **(5)**

Q7 Illustrate with sketch different types of Layouts of Distribution Network. Compare their advantages and disadvantages. **(10)**

Q8 **Write Short Notes on any Two :** **(5 x 2)**

a) Sludge volume index (SVI)
b) Cavity formation in wells
c) Oxidation pond and oxidation ditch.
d) Bulking of sludge