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WRPC201****2nd Semester Back Examination – 2016-17****WATER RESOURCE SYSTEM AN MANAGEMENT****BRANCH(S): Water Resources Engineering/ Water Resources Engg. & Management****Time: 3 Hours****Max Marks: 70****Q Code : Z513****Answer Question No.1 which is compulsory and any five from the rest.****The figures in the right hand margin indicate marks.****1Q Answer the following Questions (2 x 10)**

- What is Demineralisation in softening?
- Two particles are released in water at the same time. Particle A has a diameter d_A of 0.8mm. Particle B has a diameter d_B of 0.3mm. What is the ratio of the settling velocity of particle A to that of particle B? Assume equal densities.
- What do you understand by aquiclude, give example?
- What is Coincident Draft??
- Briefly explain media Fluidization of Filter bed.
- Define chemically pure water and state the major requirements of chemically pure water.
- Write three factors affecting settling of a particle.
- What is type-2 suspension?
- Write the expression for decreasing growth rate method of population, forecasting.
- Define discrete particle.

2Q (a) Differentiate between Intermittent supply versus continues supply. (5)**(b) Discuss the any two major methods for forecasting population for water supply design with example. (5)****3Q (a) Derive the Expression for Stoke's Equation for settlement of discrete particle. Also write the assumption followed. (5)**bput question papers visit <http://www.bputonline.com>**(b) A designer set the breadth, length and depth of the settling zone of a typical discrete type settling tank as 4m, 16m and 2.0m respectively for a flow of 2000m³/day. With this information, determine the size of discrete particle corresponding to 100% and 40% removal. Assume, the flow entering the settling zone is uniformly mixed, any particle reaching the bottom of settling zone is immediately removed and horizontal velocity of flow is less that of scouring velocity. The following data of various parameters may be used if required: Dynamic viscosity of water $\mu_w = 0.0013\text{Ns/m}^2$, acceleration due to gravity, $g = 9.81\text{m/s}^2$, specific gravity of particle = 2.65 and density of water = 999.7kg/m³ (5)****4Q Water at 20°C is passed through a filter bed at $1.0 \times 10^{-3}\text{m/s}$. The bed is 0.74m deep and is composed of non-uniform sand (with specific gravity of 2.65) stratified so that the smallest particles are on the top and the largest at the bottom. The porosity and shape factors are 0.4 and 0.85 throughout the base of the bed. The size distribution of granules is given in table below. Determine the head loss for clean water flow through the bed. (10)**

US Seive no.		Particle Size Range, mm		Average Size d_{ij} , mm	Mass fraction in size range x_{ij}
Passing	Retained	Passing	Retained		
	14		1.41	1.41	0.01

14	20	1.41	0.84	1.13	0.11
20	25	0.84	0.71	0.78	0.20
25	30	0.71	0.60	0.66	0.32
30	35	0.60	0.50	0.55	0.21
35	40	0.50	0.42	0.46	0.13
40		0.42		0.42	0.02

- 5Q** (a) Write the merit and demerit of Zeolite Process in water Treatment (5)
 (b) Briefly Explain the controlling method of Disinfection By-Products concentration. (5)
- 6Q** (a) Explain different methods for removal of colour from water. (5)
 (b) Briefly describe two methods of removing permanent hardness in water. (5)
- 7Q** (a) Describe various methods of removing iron. (5)
 (b) Describe the characteristic of a good disinfectant. (5)
- 8Q** **Write Short Note on: (any two)** (5 x 2)
 1. Break-point chlorination
 2. Excess Lime-soda Treatment
 3. Reverse Osmosis Method
 4. Mechanism of Filtration.