JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
T2- EXAMINATION (October - 2019)
B. Tech. (V- SEM.)

COURSE CODE: 10B11CE514 MAX. MARKS: 25
COURSE NAME: Water Supply Engineering
COURSE CREDIT: 4 MAX. TIME: 1.5 HRS

Note: Attempt all questions. Assume suitable data if required. Carrying of mobile phone during examinations will be treated as case of unfair means

1. Design a river intake structure for a population of 100,000 with a per capita demand of 250 l/d including (i) number and size of openings in an intake well; (ii) size, shape and height of intake well and (iii) gravity pipe for raw water connecting intake well and jack well. The R.L of the river bed is 105 m, the R.L of lowest water level is 115 m; the R.L of normal water level is 130m and R.L of high flood level is 150m. Also provide a neat sketch of final designed intake. **(6)**

2. A settling column analysis is run on suspension type-I which is having a height of 1.8 m and experimental data collected as presented in table below. Determine the theoretical efficiency if the loading rate is $25 m^3/day/m^2$ **(6)**

Time (min)	0	60	80	100	130	200	240	420
Concentration remaining (mg/l)	300	189	180	168	156	111	78	27

3. Determine the annual quantity of copperas and quicklime for a treatment plant of capacity 15MLD. The dose is 25ppm. Assume both the chemicals have 70% purity levels.
Given MW of (Ca = 40, O = 16, H = 1, C = 12, S = 32, Fe = 56) **(3)**

4. With a neat sketch, derive and explain why the settling velocity (v_t) of particle is independent of the depth of the settling chamber **(3)**.

5. With a neat sketch, explain the '*dry feeding system*' in a clariflocculator **(3)**.

6. The population of a town is 75,000 with an average demand of 135lpcd. Design coagulation cum sedimentation tank for the water treatment assuming detention periods of 4.5 hours and 45 minutes respectively for the settling tank and flocculation chamber. Assume flow rate as 1000 litres/hr/m^2 of plan area. **(4)**