

Dr. Rajni Garguly

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
T2- EXAMINATION (October - 2018)  
B. Tech. (V- SEM.)

COURSE CODE: 10B11CE514  
COURSE NAME: Water Supply Engineering  
COURSE CREDIT: 4

MAX. MARKS: 25

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 bell mouth canal intake to serve a population of 105,000 drawing water from a canal and operating only 15 hours in a day with a depth of 2.5 m. Also determine the head loss in the conduit in the intake if the treatment plant is 4.5kms away. The average water consumption is 220lpcd and assume that velocity through the bar screen and bell mouth is 0.22m/s and 0.41m/s respectively. Illustrate the design results with a neat sketch of canal intake. (5)
2. A settling column analysis is run on suspension type-I which is having a height of 2.4 m and the Initial concentration of well mixed sample of 750 mg/l. Results of the analysis are shown below. Using this table determine (a) theoretical efficiency if the loading rate is  $2.8 \times 10^{-2}$  m/min (6)

Time (min)	0	58	77	91	114	154	250
Conc'n remaining (mg/l)	750	660	516	425	315	230	152

3. Determine the annual quantity of alum and quicklime for a treatment plant of capacity 50MLD. The alum dose is 30ppm and the alkalinity of raw water is 6 mg/l of  $\text{CaCO}_3$ . Assume both the chemicals have 75% purity levels. Given MW of (Al = 27, Ca = 40, O = 16, H = 1, C = 12, S = 32) (4)
4. With a neat sketch explain the concept of 'water dispersed in air' (3).
5. Compare the advantages and disadvantages of using ferric salts and alum as coagulant (2).
6. A rectangular sedimentation tank is required to treat a flow of 4.5 MLD. The size of the tank is 20x6x3.5m. If 100 ppm suspended solids are present in water and assuming 70% as removal efficiency for particles having specific gravity of 2.5. Determine (a) average flow of water through the tank (b) Detention time (c) overflow rate and (d) deposition of solids in the tank (5).