

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
MAKEUP EXAMINATION (April - 2018)
B.Tech (VIII –SEM)/M. Tech. (II- SEM.)

COURSE CODE: 14M31CE213
 COURSE NAME: Industrial Wastewater Treatment
 COURSE CREDIT: 3

MAX. MARKS: 25
 MAX. TIME: 1.5 HRS

Note: Attempt all Questions. Carrying of mobile phones during exams will be treated as case of unfair means. Assume suitable data if required.

1. Write short notes on (a) with neat flow sketches the *inline* and *offline* systems of functioning of Equalization basin, (b) the importance of hydraulic loading rate in determination of bed depth (2+2)
2. From the following data, determine (a) the optimum bed depth graphically, (b) weight of acid neutralized per day and (c) annual limestone requirement, given the flow is $0.25 \text{ m}^3/\text{min}$ and having $0.2\text{N H}_2\text{SO}_4$. (5)

Depth (m)	0.152	0.305	0.61	0.93	1.25
HLR ($\text{m}^3/\text{m}^2/\text{hr}$)	1.71	7.35	37.6	58.92	64.32

3. Discuss some of the major undesirable waste characteristics of industrial wastes in general and their potent effects on receiving stream if untreated. (5)
4. A highly acidic wastewater has a flow rate of $0.75 \text{ m}^3/\text{min}$ and requires neutralization prior to secondary treatment with a total lime requirement of 3800 mg/l . Determine (a) the inline systems for the application of lime (b) the total lime requirement for the treatment process and (b) the volume of the neutralization tank if detention time is 30 minutes. (3)
5. With a neat sketch, discuss the process of oil separation with a plate separator. (5)
6. The influent oil concentration in an industrial waste is 180 mg/l with a flow rate of $650 \text{ m}^3/\text{min}$ and is desired to have an effluent concentration of 10 mg/l . The A/S ratio is 0.04 and air solubility is 19.8 mg/l . The recycled pressure is 625 kg/cm^2 . Assume $f=0.88$. Assume the system reaches normal atmosphere pressure conditions (1 Atm) after release. Calculate the recirculation rate (R) (3)