Dr. Anirban Dutta

Roll No:.....

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- APRIL 2019

B. Tech 8th Semester

COURSE CODE: 14M31CE214 MAX. MARKS: 25

COURSE NAME: Process Design in Environmental Engg.

COURSE CREDITS: 03 MAX. TIME: 1.5 Hrs

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.* (***Assume any other necessary data suitably***)

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1. Derive the mass balance solution for ideal flow in complete mix reactor and plug flow rector (Consider pulse input). Discuss the application of mass balance equation. **(2+2+2)**
2. What is DEWAT system? Draw the output tracer response curves from complete mix and plug flow reactors subject to pulse and step inputs of a tracer. **(4)**
3. Derive biomass mass balance and substrate balance equation of suspended growth system in a complete mix reactor without recycle. **(4)**
4. Explain the following terms related to membrane processes: (i) Penneate flow (ii) Membrane fouling (iii) Solute mass flux density (iv) Reverse osmosis **(2)**
5. What is nitrification? Discuss effect of DO concentration and pH on suspended growth nitrification process. **(3)**
6. Write brief notes on denitrification process. What are reactions involved in denitrification process. **(4)**
7. The following tests results were obtained for a wastewater sample. All the tests were performed using a sample size of 50 ml. Determine the amount methanol (CH_3OH) required for cell synthesis for that sample. Initial NO_3^- - N concentration 0.45 mg/l, Initial NO_2^- - N concentration 0.98 mg/l. Dissolved oxygen concentration 7 mg/l. **(2)**