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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
T-2 EXAMINATION (April- 2019)  
B. Tech. (VIII- SEM.)

COURSE CODE: 14M31CE215

MAX. MARKS: 25

COURSE NAME: Surface Water Quality Management

COURSE CREDIT: 3

MAX. TIME: 1 Hr 30 Min

*Note: Attempt all Questions. Assume suitable data if required. Calculator allowed. Graph Paper allowed*

1. Estimate the deoxygenating constant, reaeration constant and BOD settling rate at a reach of 10kms for the following data: [5 Marks]

Average stream velocity = 0.2m/s

Upstream flow = 2.65 m<sup>3</sup>/day

Downstream flow = 2.75 m<sup>3</sup>/day

Temperature = 23°C

Location	K1 (20°C)	BOD <sub>5</sub> (mg/L)	DO Deficit (mg/L)
Upstream	0.46	6.0	6.3
Downstream	0.37	3.3	3.8

Temp. °C	K1	K2	K3	L
22	1.096	1.032	1.153	1.04
24	1.202	1.065	1.331	1.08

2. What were the objectives of undertaking Ganga Action Plan and mention some of its salient features. [3 Marks]
3. What are the assumptions made in deriving the DO-BOD relationship in streams (Streeter – Phelps Model). What are the limitations of the model? [5 Marks]
4. Define Estuary? Why are they important? How are they threatened? [2 Marks]
5. (a) If the per capita contribution of suspended solids and BOD is 90 gm and 55 gm, find the population equivalents of:-
- (i) A combined system serving 1000 persons and having 75 gm per capita daily of BOD and
  - (ii) 40,000 litres daily of industrial waste water containing 1800 mg/l of suspended solids. [2.5 Marks]
- (b) In a test conducted for determining the relative conductivity at 20°C, the period of incubation was found to be 12 days. Calculate the per cent of relative stability. [2.5 Marks]
6. (a) The 3 days 15°C BOD of a sample of surface water is 150 mg/l. Draw a graph of 5 day BOD as a function of temperature in the range 10°C to 30°C in steps of 5°C. [2.5 Marks]
- (b) BOD tests performed on 5ml samples of river through 300 ml standard BOD bottles at different times, have yielded the following results. Compute:-
- (i) the value of BOD rate constant
  - (ii) the value of BOD<sub>5</sub>
  - (iii) the value of ultimate BOD.

<b>Bottle No.</b>	<b>Initial DO (mg/l)</b>	<b>Incubation period in days</b>	<b>Final DO (mg/l)</b>
1	8.4	0.5	7.45
2	8.4	1.0	6.7
3	8.4	1.5	6.1
4	8.4	2.0	5.5
5	8.4	3.0	4.6
6	8.4	5.0	3.6

[2.5 Marks]