

## JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

## TEST -1 EXAMINATION- 2018

## M.Tech I Semester

COURSE CODE: 14M31CE212

MAX. MARKS: 15

COURSE NAME: CONTAMINANT TRANSPORT

COURSE CREDITS: 03

MAX. TIME: 1 HR

---

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

---

- Q1.a) What are the various units used for expressing the concentration of a chemical in water? Discuss on the ambiguities related to the use of same units (as in water) in Air and Soil. [03 Marks]
- b) The molecular weight of benzene is 78. If the concentration of benzene in air is  $10\text{mg/m}^3$ , convert to the units of ppm.  
( $\text{Conc. mg/m}^3 = 0.0409 \times \text{Conc. ppm / mol.wt}$ ) [02 Marks]
- Q2.a) What do you mean by "Material Balance" and how it is important in the analysis of fate and transport of a contaminant in the environment? [02 Marks]
- b) Define "Control Volume". With the help of a neat figure, explain the control volume that is useful for estimating chemical mass balance in a lake. [03 Marks]
- Q3.a) Define "Flux Density". Discuss the role of turbulent diffusion in mass transport of a contaminant in the environment. How do you relate flux density with turbulent diffusion? [02 Marks]
- b) If the salt concentration in a river is  $20\text{mg/L}$  and the average river velocity is  $100\text{ cm/sec}$ , what is the average flux density  $J$  of salt in the downstream direction? [02 Marks]
- c) Discuss the factors on which molecular diffusion coefficient depends upon? [01 Mark]