

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- September 2016

M.Tech III Semester

COURSE CODE: 15M3WCE311

MAX. MARKS: 15

COURSE NAME: Environmental Geotechnics

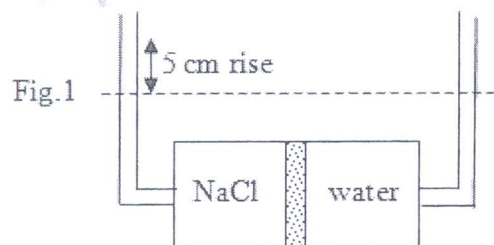
COURSE CREDITS: 03

MAX. TIME: 1Hr

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

1. Compare the impact of solid waste disposal and liquid waste disposal on subsurface contamination. [3]
2. Figure 1 represents the equilibrium condition (after time t) of water separated from NaCl by using a semi-permeable membrane at a room temperature of 27°C . There is a rise in solution level by 5cm.
 - a) Illustrate with a figure, the condition at time $t = 0$.
 - b) Explain what has happened thereafter till time ' t ' and why?
 - c) Also calculate the molar concentration of the NaCl solution. The value of ' C ' is $0.0820 \text{ Litre.atm/Kelvin.mole}$. The density of NaCl is 1.2 g/cc . ($1 \text{ atm} = 0.1 \text{ MPa}$).

[2 + 2 + 2 = 6]



3. What is the diffusible double layer? Why is it important in geoenvironmental studies? [2]
4. Liquid waste is being discharged into shallow injection well. The subsoil consists of medium sand with coefficient of permeability of $2 \times 10^{-4} \text{ m/sec}$ and a porosity of 35%. The ground water table is located 5 m below the ground surface and hydraulic gradient causing ground water flow is 0.007. A drinking water tube well is located 1.5 km away from the injection well on the downstream side as shown in the figure below. Once the