**Mass Transfer-1 Class Test**

**Time Duration: 30 minutes Date: 13th Feb 2023**

**Instructions:**

1.Assume atmospheric temperature and pressure, and required constants if not mentioned.

2. If constants are not provided then solve in terms of the missing constant.

Q.1. Ammonia is absorbed from the ammonia(A)-air(B) mixture in sulphuric acid. The concentration of ammonia in the air 10 mm from the acid surface is 40% by volume and that at the acid surface is negligible. The total pressure in the system is 400 mm Hg and the temperature is 300 K. Calculate

(a) the rate of absorption of ammonia across 0.1 m2 gas-liquid contact area,

(b) the partial pressure gradient of ammonia at 4 mm from the acid surface, and

(c) the rate of mass transfer of ammonia by molecular transport and that by bulk flow at the two ends of the film.

Q.2. At a particular section of equipment for absorption of the solute A in a liquid, the bulk gas phase contains 9.5 mol% A and the liquid contains 2 mol% of it. The gas-film coefficient is k, = 10 kmol/(h) (m2)(y) and 60% of the mass transfer resistance occurs in the liquid film. Henry's law applies, YA = 0.85XA. Calculate

(a) the overall mass transfer coefficient, K;

(b) the molar flux of A; and

(c) the interfacial concentrations of the solute, XAi and YAi.