Introduction to Transport Phenomena: Modules 4-5

Module 4

Q#	Question	True	False
Q01	The Fick's law describes mass transfer by convection	☐	☐
Q02	Molecular diffusion is driven by a gradient in concentration	☐	☐
Q03	The molar diffusivity is given per each single substance and does not depend on the diffusion medium.	☐	☐
Q05	The diffusion coefficient decreases with increasing temperature in both liquids and gases.	☐	☐
Q04	In the description of diffusive systems, both mass unit and molar units can be used	☐	☐
Q06	In binary systems, the molar flux of the two species are equal but opposite	☐	☐
Q07	In the equation $n_A = x_A(n_A + n_B) - c\, D_{AB} \frac{dx_A}{dy}$ the first term describes diffusion while the second term convection	☐	☐
Q08	In the evaporation of a liquid through a column of stagnant gas, you can assume that the molar fraction of the liquid at the top of the column is zero if air is flowing at the top.	☐	☐
Q09	In the description of the molecular transport across phase boundaries, we assume that the bulk concentration (outside the boundary layer) is constant.	☐	☐
Q10	In the description of the molecular transport between two phases, the concentrations of the transported specie at the interphase are equal.	☐	☐
Q11	The use of mass transfer coefficient is a more approximate way to solve mass transport problems		
Q12	The use of an apparent mass transfer coefficient implies that diffusion at the interphase is negligible because equilibrium is reached quickly.	☐	☐
Q13	When the overall mass transfer coefficient is used instead of the local mass transfer coefficient, the equilibrium concentrations can be used instead of the actual concentrations at the phase boundary.	☐	☐

Module 5

Q#	Question	True	False
Q01	Momentum transport is driven by change in velocity	☐	☐
Q02	The momentum is transferred perpendicularly to the direction of flow	☐	☐
Q03	Momentum transport is caused by viscosity	☐	☐
Q04	The viscosity is a macroscopic property of the fluid		
Q05	The viscosity increases with increasing temperature in both liquids and gases.	☐	☐
Q06	The shear stress is proportional to the velocity gradient	☐	☐
Q07	The shear stress is a vector	☐	☐
Q08	The shear stress and the momentum flux are different		
Q09	In the Newton's law of viscosity $\frac{F}{A} = \mu \frac{V}{Y}$ A is the area perpendicular to the direction of the flow	☐	☐
Q10	In the In the Newton's law of viscosity written for Q09, Y indicates the length of the plate moving on top of the fluid	☐	☐
Q11	Write what the two subscripts x and y indicate in τ_{yx}		