

Indian Institute of Science Education and Research Kolkata

Earth System Process (ES1201, Spring 2022)

Assignment-2

Note: Please submit the scanned copy of the worked-out assignment. You are free to discuss among yourselves. However, any attempt to copy blindly will result into zero marks for everyone involved. You need to write answers based on your own understanding. Do not simply copy and paste from the internet and books.

1. What is upwelling and where does it occur? Does Ekman transport play a role in upwelling and downwelling? Please explain.
2. Explain the physics of geostrophic current.
3. Explain the bottom-water formation and its importance for driving deep ocean circulation.
4. Explain briefly why the source of major fraction of Earth waters seems to be from meteorites but not from comets.
5. Briefly explain the role of greenhouse gases in early Earth atmosphere when the luminosity of Sun was 30% less than that of today (Faint Young Sun).