**Reading guidelines for Lecture 05: Monsoon over South Asia**

1. Why the Indian monsoon is the most powerful regional monsoon around the world?
2. Winter disturbances observed in the South Asian sector, which are rainfall/snow makers, have two sources: western disturbances from the west, and easterly waves from the east. The former is dynamically driven and the latter is mainly thermally driven.
3. During the transition season (March-to-May), heat low over land and cold high over the adjoining ocean start to develop to the south whereas the westerly disturbances still prevail to the north portion of the Subcontinent.
4. During the transition season (March-to-May), strong subsidence and divergence still prevails above the surface heat low. With adiabatic cooling of the rising air near the surface and adiabatic warming of the subsidence aloft, it leads to a stable stratification in the vertical and thereby the savanna climate.
5. The *Kal-Baisakhis (deadly) storms* can form in the months of April and May over the eastern India and Bangladesh.
6. The developments of cross-equatorial flow, equatorial westerlies, double equatorial troughs (NET and SET), and cyclonic activity over the equatorial eastern Indian Ocean are noticeable weather events during the transition season.
7. Notions should be given to the synoptic conditions (Ananthakrishnan et al 1968) associated with the onset of Indian summer monsoon.
8. The advance period of Indian summer monsoon can be divided into 3 stages. The synoptic aspects are highlighted in Fig. 4.8.
9. The first move of Indian summer monsoon is from the eastern Bay of Bengal (why?). It has two main routes (why?).
10. Notions should be given to the formation of *Somali jet* which is important for the monsoon advance over the Arabian Sea.
11. Climatologically, the monsoon wave to the west of the subcontinent (i.e., Arabian Sea sector) lags behind that to the east of subcontinent (i.e., Bay of Bengal). See Figure 4.9. Why?
12. In stage two, heavy rainfall mainly occurs along the ITCZ to the S/SW and along the TCZ (also called monsoon trough, which runs along the foothills of Himalayas) to the N/NE. Nevertheless, deficient rainfall appears in between.
13. When the monsoon is in its full swing in August, the east-west extension of South Asian High in the upper troposphere covers the Mediterranean Sea to the west and reaches Pacific Ocean to the east.
14. What are the onset vortex and the monsoon depression?
15. Retreating monsoon rain over Tamil Nadu (and Sri Lanka) is associated with the formation of autumn trough. See Fig. 4.15.
16. Notions should be given to the factors responsible for the interannual variability of Indian summer monsoon rainfall.
17. Definition of active monsoon and break monsoon. Notions should be given to the causes of them.