**SEA2004F Class Test : 20th March, 2013**

**Total 55 marks. Answer all questions**

**Section A (Dr I. Ansorge)**

1. Describe the differences between western and eastern boundary currents in terms of

width, speed, depth and temperature. List three eastern boundary currents. (5)

2. Draw a typical Ekman spiral associated with the SE trade wind belt in the southern hemisphere. Include in your figure the direction of the net Ekman transport. (5)

3. Using the TS plot overleaf provide the following values for A, B and C: (T = Temperature, S = Salinity)

when A = T 20°C, σt = 26 – what is the salinity?

when B = S 35.5, T 15°C – what is the density?

when C = a mix of A and B (5)

4. Why are oxygen and nutrients classified as non-conservative properties? Give 2 examples of properties associated with sea water that are conservative. (5)

5. With the aid of two diagrams describe the main characteristics of the Somali Current. How is this current affected by the Monsoon? (5)

**Section B (Prof C. Reason)**

1. List the various types of energy fluxes at the surface. Give the units and show that these are equivalent to an energy measured per unit area per unit time (10)

2. Referring to the hydrological cycle over the ocean, what are the important inflows and outflows and how do these compare to these variables over land? (5)

3. Using appropriate values for the scales, show that the flow in the South Atlantic Current is geostrophic (5)

4. Explain what the Sverdrup balance in ocean circulation means (5)

5. True or False (1 mark for each correct answer, 0 for incorrect answer) (5)

a) On average, the ITCZ lies south of the equator over the Atlantic Ocean

b) The Walker circulation is not a direct thermal cell

c) The East Australian Current is the weakest western boundary current

d) In the Ekman layer, there is an approximate balance between Coriolis and friction

e) The terms "meridional overturning circulation" and "global thermohaline circulation" mean the same

NAME \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

