FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA
SCHOOL OF SCIENCE AND SCIENCE EDUCATION
DEPARTMENT OF GEOGRAPHY

FIRST SEMESTER 2013/2014 SESSION UNDERGRADUATE EXAMINATION

COURSE CODE: MET 320
COURSE TITLE: ATMOSPHERIC CIRCULATION II

INSTRUCTION: Answer any four questions
TIME ALLOWED: 2 hrs 30mins

1. a. Explain each of the following:

   (i) Geopotential   (ii) Hydrostatic balance   (iii) Potential temperature   (iv) Surface Wind

   b. A parcel of air is being lifted from the surface (1000mb) to a height of 2km. If the density of air is $0.9kgm^{-3}$ and acceleration due to free fall is $9.8ms^{-2}$. Compute the pressure at the 2km height. State the assumptions used in achieving this.

2. using the first law of Thermodynamics derive an expression for the Poison's equation and explain each term in the equation.

3. Assess the contribution of internal friction which exists between layers of a liquid or a gas in motion to the general circulation of the atmosphere.

4(.a) When is the atmosphere said to be in a hydrostatic equilibrium?

(b) Drive the hydrostatic equation

(c) Suppose at the surface a1000m thick layer of air (under standard conditions) has an average density of 1.1kgm-3 and acceleration of gravity 9.8ms-2. Use hydrostatic equation to compute the differences in pressure.

5. Outline and explain the bases which conventional classification of air masses based upon.

6. a. What do you understand by the term 'Kinematic'?

   b. Enumerate and explain varieties of quantities associated with motion of objects.