**LEVEL THREE COMBINED ASSESSMENT – STUDY GUIDE**

1. **Define aircraft stability.**

The tendency of an aircraft in flight to remain in straight, level, upright flight and toreturn to this attitude, if displaced, without corrective action by the pilot.

1. **Define Dewpoint.**

Dewpoint is the temperature to which unsaturated air must be cooled, at a constantpressure, in order for it to become saturated.

1. **Define directional stability.**

Stability around the vertical axis.

1. **Define relative humidity.**

The ratio of the actual amount of water present in the air compared to the amountthat the same volume of air could hold.

1. **Define wind.**

The horizontal movement of air within the atmosphere.

1. **Describe a low pressure area.**

Low pressure areas are areas of relatively low pressure, with the lowest pressure in the center. Lows will normally move in an easterly direction at an average rate of 800km per day during the summer and 1100km per day in the winter. Lows are associated with thunderstorms and tornadoes, and do not stay in one place for very long. In the northern hemisphere, air moves around a low in a counter-clockwise direction.

1. **Describe convection as a lifting agent.**

The air is heated through contact with the earth's surface. As the sun heats the surface of the earth, the air in contact with the surface warms up, rises, and expands.

1. **Describe static and dynamic stability.**

Static stability is the initial tendency of an aircraft to return to its original attitude, if displaced. Dynamic stability is the overall tendency of an aircraft to return to its original attitude.

1. **Describe the assumptions for standard atmosphere in North America.**

The assumptions for standard atmosphere in North America include:

- the air is a perfectly dry gas

- a mean sea level pressure of 29.92" Hg

- a mean sea level temperature of 15°C

- the rate at which temperature decreases with altitude is 1.98°C per 1000 feet

1. **Describe unstable air and the flight conditions associated with unstable air.**

If a mass of rising air is still warmer than the new air around it, then the air mass will continue to rise. Unstable air may have the following effects on flight:

- good visibility (except in precipitation)

- cumulus type cloud

- showery precipitation

- gusty winds

- moderate to severe turbulence

1. **Explain capacity for expansion as a property of the atmosphere.**

Air is forced to rise for various reasons. As the air pressure decreases, the air will expand and cool. This cooling may be enough for condensation to occur and clouds to form, creating precipitation.

1. **Explain mobility as a property of the atmosphere.**

This property is the ability of the air to move from one place to another. This is especially important as it explains why an air mass that forms over the arctic may affect places in the south.

1. **What are the layers of the atmosphere, in order?**

Troposphere, Stratosphere, Mesosphere, Thermosphere, Exosphere

1. **What are the two main types of cloud classification?**

Cumulus and Stratus.

1. **What is one factor that influences longitudinal stability?**

Centre of gravity.

1. **What is the composition of the atmosphere?**

78% Nitrogen, 21% Oxygen, 1% everything else.

1. **What joins areas of equal atmospheric pressure?**

Isobars.

1. **Which layer of the atmosphere includes the ozone layer?**

The Stratosphere.