AVIATION SUBJECTS – COMBINED ASSESSMENT PC – ASSESSMENT INSTRUCTIONS

PREPARATION

PRE-ASSESSMENT INSTRUCTIONS

Review the assessment plan, assessment instructions and Aviation Subjects – Combined Assessment PC and become familiar with the material prior to conducting the assessment.

Photocopy the assessment tool for each cadet.

PRE-ASSESSMENT ASSIGNMENT

N/A.

ASSESSMENT METHOD

A selected response assessment was chosen to assess the cadet's knowledge of the principles of flight, meteorology and navigation.

CONDUCT OF ASSESSMENT

PURPOSE

The purpose of this PC is to assess the cadet's knowledge of aviation subjects in principles of flight, meteorology and navigation.

RESOURCES

- Aviation Subjects – Combined Assessment PC, and
- Pen/pencil.

ASSESSMENT ACTIVITY LAYOUT

This assessment shall be conducted in a classroom. Desks shall be separated as much as possible.

ASSESSMENT ACTIVITY INSTRUCTIONS

1. Ensure that the cadets have a pen or pencil with eraser.
2. Distribute the assessment to each cadet face up and instruct them to begin only when told to do so.
3. Explain the structure of the assessment.
4. Explain the point value of each section, and that the short answer questions require one main point for each point value.
5. Ensure the cadets have written their names on the top of the assessment.
6. Have the cadets write the assessment.
7. Give the cadets a 10-minute warning.
8. Give the cadets a 5-minute warning.
9. Collect the assessments.

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POST ASSESSMENT INSTRUCTIONS

RECORDING ASSESSMENT RESULTS

The overall rating for Aviation Subjects – Combined Assessment PC will be recorded on the Proficiency Level Three Qualification Record located at Chapter3C.

PROVIDING ASSESSMENT FEEDBACK

A debrief should be given on an individual basis for those cadets who scored less than 60 percent on the assessment. Any cadets who require a re-test must be debriefed prior to the re-test. The content of the debriefing will vary depending on the individual cadet. The aim of the debriefing is to review the mistakes made in the original assessment and to prepare the cadet for the re-test.

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AVIATION SUBJECTS – COMBINED ASSESSMENT PC

Cadet's Name: _____ Squadron: _____

Flight: _____

PART A – MULTIPLE CHOICE (10 points)

1. Aircraft stability is defined as:

   a. the stability of the chemical bonds of the material used in the aircraft's construction;
   b. the overall tendency of an aircraft to return to its original attitude;
   c. the overall tendency of an aircraft to remain in a new attitude; or
   d. the tendency of an aircraft in flight to remain in straight, level, upright flight and to return to this attitude, if displaced, without corrective action by the pilot.

2. Which of the following is a factor influencing longitudinal stability?

   a. centre of gravity,
   b. centre of pressure,
   c. dihedral, or
   d. keel effect.

3. Directional stability is defined as:

   a. stability around the lateral axis;
   b. stability around the vertical axis;
   c. stability around the longitudinal axis; or
   d. stability of the pilot.

4. Which is the lowest layer of the atmosphere?

   a. the troposphere,
   b. the stratosphere,
   c. the mesosphere, or
   d. the thermosphere.

5. Seventy-eight percent of the atmosphere is composed of this gas?

   a. oxygen,
   b. water vapour,
   c. argon, or
   d. nitrogen.

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6. Which layer of the atmosphere includes the ozone layer?

   a. the troposphere,
   b. the stratosphere,
   c. the mesosphere, or
   d. the thermosphere.

7. The two main types of cloud classification are:

   a. Romulus and Stradivarius,
   b. Cumulus and Stratus,
   c. Venus and Pluto, or
   d. Cirrus and Alto.

8. Areas of equal atmospheric pressure are joined together by:

   a. isotherms,
   b. isosceles,
   c. contour lines, or
   d. isobars.

9. Wind is defined as:

   a. the horizontal movement of air within the atmosphere;
   b. the vertical currents created by uneven heating of the earth;
   c. the circulation of air; or
   d. the reaction that occurs when nitrogen and oxygen are mixed together.

10. Relative humidity is defined as:

    a. the amount of water consumed by a cousin;
    b. the amount of water in relation to the density of the air;
    c. the humidity of the earth's atmosphere relative to the moon; or
    d. the ratio of the actual amount of water present in the air compared to the amount that the same volume of air could hold.

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PART B – SHORT ANSWER (15 points)

1. Describe static and dynamic stability. (2 points)

2. Describe convection as a lifting agent. (2 points)

3. Describe unstable air and the flight conditions associated with unstable air. (3 points)

4. Explain mobility as a property of the atmosphere. (1 point)

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5. Explain capacity for expansion as a property of the atmosphere. (1 point)

6. Describe the assumptions for standard atmosphere in North America. (2 points)

7. Describe a low pressure area. (2 points)

8. Define dewpoint. (1 point)

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ANSWER KEY

PART A – MULTIPLE CHOICE (10 points)

1. Aircraft stability is defined as:

   a. the stability of the chemical bonds of the material used in the aircraft's construction;
   b. the overall tendency of an aircraft to return to its original attitude;
   c. the overall tendency of an aircraft to remain in a new attitude; or
   d. the tendency of an aircraft in flight to remain in straight, level, upright flight and to return to this attitude, if displaced, without corrective action by the pilot.

2. Which of the following is a factor influencing longitudinal stability?

   a. centre of gravity,
   b. centre of pressure,
   c. dihedral, or
   d. keel effect.

3. Directional stability is defined as:

   a. stability around the lateral axis;
   b. stability around the vertical axis;
   c. stability around the longitudinal axis; or
   d. stability of the pilot.

4. Which is the lowest layer of the atmosphere?

   a. the troposphere,
   b. the stratosphere,
   c. the mesosphere, or
   d. the thermosphere.

5. Seventy-eight percent of the atmosphere is composed of this gas?

   a. oxygen,
   b. water vapour,
   c. argon, or
   d. nitrogen.

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6. Which layer of the atmosphere includes the ozone layer?

   a. the troposphere,
   b. the stratosphere,
   c. the mesosphere, or
   d. the thermosphere.

7. The two main types of cloud classification are:

   a. Romulus and Stradivarius,
   b. Cumulus and Stratus,
   c. Venus and Pluto, or
   d. Cirrus and Alto.

8. Areas of equal atmospheric pressure are joined together by:

   a. isotherms,
   b. isosceles,
   c. contour lines, or
   d. isobars.

9. Wind is defined as:

   a. the horizontal movement of air within the atmosphere;
   b. the vertical currents created by uneven heating of the earth;
   c. the circulation of air; or
   d. the reaction that occurs when nitrogen and oxygen are mixed together.

10. Relative humidity is defined as:

   a. the amount of water consumed by a cousin;
   b. the amount of water in relation to the density of the air;
   c. the humidity of the earth's atmosphere relative to the moon; or
   d. the ratio of the actual amount of water present in the air compared to the amount that the same volume of air could hold.

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PART B – SHORT ANSWER (15 points)

1. Describe static and dynamic stability. (2 points)

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.

2. Describe convection as a lifting agent. (2 points)

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.

Convection can also occur when air moves over a warmer surface and is heated by advection.

3. Describe unstable air and the flight conditions associated with unstable air. (3 points)

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, and**
- **moderate to severe turbulence.**

4. Explain mobility as a property of the atmosphere. (1 point)

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.

5. Explain capacity for expansion as a property of the atmosphere. (1 point)

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.

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6. Describe the assumptions for standard atmosphere in North America. (2 points)

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° Celsius, and**
- **the rate at which temperature decreases with altitude is 1.98° Celsius per 1000 feet.**

7. Describe a low pressure area. (2 points)

Low pressure areas are areas of relatively low pressure, with the lowest pressure in the centre. Lows will normally move in an easterly direction at an average rate of 800 km per day during the summer and 1100 km 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.

8. Define dewpoint. (1 point)

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

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AVIATION SUBJECTS - COMBINED ASSESSMENT PC REWRITE

Cadet's Name: _____ Squadron: _____

Flight: _____

PART A – MULTIPLE CHOICE (10 points)

1. Seventy-eight percent of the atmosphere is composed of this gas?

   a. oxygen,
   b. water vapour,
   c. argon, or
   d. nitrogen.

2. The two main types of cloud classification are:

   a. Romulus and Stradivarius,
   b. Cumulus and Stratus,
   c. Venus and Pluto, or
   d. Cirrus and Alto.

3. Which layer of the atmosphere includes the ozone layer?

   a. the troposphere,
   b. the stratosphere,
   c. the mesosphere, or
   d. the thermosphere.

4. Which of the following is a factor influencing longitudinal stability?

   a. centre of gravity,
   b. centre of pressure,
   c. dihedral, or
   d. keel effect.

5. Relative humidity is defined as:

   a. the amount of water consumed by a cousin;
   b. the amount of water in relation to the density of the air;
   c. the humidity of the earth's atmosphere relative to the moon; or
   d. the ratio of the actual amount of water present in the air compared to the amount that the same volume of air could hold.

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6. Directional stability is defined as:

   a. stability around the lateral axis;
   b. stability around the vertical axis;
   c. stability around the longitudinal axis; or
   d. stability of the pilot.

7. Areas of equal atmospheric pressure are joined together by:

   a. isotherms,
   b. isosceles,
   c. contour lines, or
   d. isobars.

8. Wind is defined as:

   a. the horizontal movement of air within the atmosphere;
   b. the vertical currents created by uneven heating of the earth;
   c. the circulation of air; or
   d. the reaction which occurs when nitrogen and oxygen are mixed together.

9. Which is the lowest layer of the atmosphere?

   a. the troposphere,
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10. Aircraft stability is defined as:

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PART B – SHORT ANSWER (15 points)

1. Explain mobility as a property of the atmosphere. (1 point)

2. Explain capacity for expansion as a property of the atmosphere. (1 point)

3. Describe convection as a lifting agent. (2 points)

4. Describe static and dynamic stability. (2 points)

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REWRITE ANSWER KEY

PART A – MULTIPLE CHOICE (10 points)

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Assessor's Feedback:

Assessor's Name:	Position:
Assessor's Signature:	Date:

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