Study and Reference Guide

for written examinations
for the

Commercial Pilot Licence

Aeroplane

Sixth Edition
November 2009
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GENERAL INFORMATION

EXAMINATION PREREQUISITES
CAR 401.13(1)
Prior to taking a written examination, an applicant for a flight crew permit, licence or rating shall meet the prerequisites for the examination set out in the personnel licensing standards with respect to

a) medical fitness;
b) identification;
c) a recommendation from the flight instructor who is responsible for the training of the applicant; and
d) experience.

KNOWLEDGE REQUIREMENTS
Applicants for the Commercial Pilot Licence in the Aeroplane Category shall demonstrate their knowledge by writing a Transport Canada multiple choice examination on the subjects contained in this guide. Applicants must be able to read the examination questions in either English or French without assistance.

All subjects in this guide are considered to be important to applicants for the Commercial Pilot Licence - Aeroplane. Some of the subjects appeared in the Private Pilot study guide. Additional subjects, and those where more depth of understanding is required at the commercial level, are shaded (this paragraph is an example). Subjects marked with a bullet (•) are considered essential knowledge for the commercial applicant.

EXAMINATION RULES
CAR 400.02
(1) Except as authorized by an invigilator, no person shall, or shall attempt to, in respect of a written examination,
   a) copy or remove from any place all or any portion of the text of the examination;
   b) give to or accept from any person a copy of all or any portion of the text of the examination;
   c) give help to or accept help from any person during the examination;
   d) complete all or any portion of the examination on behalf of any other person; or
   e) use any aid or written material during the examination.

(2) A person who commits an act prohibited under subsection (1) fails the examination and may not take any other examination for a period of one year.

MATERIALS REQUIRED
A pencil is required for rough work. Electronic calculators are useful and are permitted if their memory is cleared before and after the examination. Computers capable of storing text are not approved. Navigation tools (ruler/scale, protractor, flight computer) are required for the navigation questions. A list of approved electronic navigation computers is available at: http://www.tc.gc.ca/eng/civilaviation/opssvs/general-exams-computers-2011.htm
TIME LIMITS
Examinations, including all sections of a sectionalized examination, that are required for the issuance of a permit or licence or for the endorsement of a permit or licence with a rating shall be completed during the 24-month period immediately preceding the date of the application for the permit, licence or rating.

REWRYING OF EXAMINATIONS
CAR 400.04(1)
Subject to subsections (2) and (6), a person who fails an examination or a section of a sectionalized examination required for the issuance of a flight crew permit, licence, rating or foreign licence validation certificate is ineligible to rewrite the examination or the failed section for a period of

a) in the case of a first failure, 14 days;
b) in the case of a second failure, 30 days; and
c) in the case of a third or subsequent failure, 30 days plus an additional 30 days for each failure in excess of two failures, up to a maximum of 180 days.

EXAMINATION FEEDBACK
Feedback statements on the results letter will inform the candidate where questions were answered incorrectly.

Example of Feedback Statement
Identify the atmospheric conditions favourable to thunderstorm formation.
EXAMINATIONS

FULL EXAMINATION

<table>
<thead>
<tr>
<th>Examination</th>
<th>Questions</th>
<th>Time Limit</th>
<th>Pass Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Pilot – Aeroplanes (CPAER)</td>
<td>100</td>
<td>3½ hours</td>
<td>60%</td>
</tr>
</tbody>
</table>

This examination is sectionalized into four mandatory subject areas and requires an overall pass mark of 60%. As well, the candidate must achieve 60% in each of the four mandatory subject areas. They are:

- AIR LAW
- NAVIGATION
- METEOROLOGY
- AERONAUTICS - GENERAL KNOWLEDGE

Applicants who obtain less than 60% on the overall examination will, for licensing purposes, be required to rewrite the complete paper. The rewrite provisions detailed in the CARs, Part IV, apply.

SUPPLEMENTARY EXAMINATIONS

Applicants who obtain 60% or more on the overall examination (CPAER), but who fail one or more mandatory subject areas will be assessed a partial pass. During one sitting, they will be required to write supplementary examinations for each subject area failed.

Details on the mandatory subject area supplementary examinations are as follows:

<table>
<thead>
<tr>
<th>Examination</th>
<th>Questions</th>
<th>Time Limit</th>
<th>Pass Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIR LAW (CALAW)</td>
<td>20</td>
<td>1 hour</td>
<td>60%</td>
</tr>
<tr>
<td>NAVIGATION (CANAV)</td>
<td>25</td>
<td>2 hours</td>
<td>60%</td>
</tr>
<tr>
<td>METEOROLOGY (CAMET)</td>
<td>25</td>
<td>1½ hours</td>
<td>60%</td>
</tr>
<tr>
<td>AERONAUTICS – GENERAL KNOWLEDGE (CAGEN)</td>
<td>35</td>
<td>1½ hours</td>
<td>60%</td>
</tr>
</tbody>
</table>

**Note:** When writing more than one supplementary examination, the maximum time allowed shall be the sum of the times indicated for each examination, not to exceed 3½ hours.

Although the overall and supplementary examinations contain questions related mostly to the sections shown under the above four mandatory subject areas, there may be occasions where knowledge from another subject area is required to arrive at the correct response. For example, a practical question on fuel calculations under Navigation and Radio Aids – Section 2 may require knowledge of VFR fuel requirements under Air Law and Procedures – Section 1.
HELCOPER TO AEROPLANE EXAMINATION
Pilots who hold a valid Canadian Commercial or Airline Transport Pilot Licence in the Helicopter Category and who wish to apply for a Commercial Pilot Licence, Aeroplane Category, shall demonstrate their knowledge by writing the following Transport Canada multiple choice examination:

<table>
<thead>
<tr>
<th>Examination</th>
<th>Questions</th>
<th>Time Limit</th>
<th>Pass Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial Pilot Aeroplane Rating – Alternate Category (CARAC)</td>
<td>35</td>
<td>1½ hours</td>
<td>60%</td>
</tr>
</tbody>
</table>

The CARAC examination is based on subjects contained in the following sections of this Guide: Air Law and Procedures; Meteorology – Upper Air Charts; Airframes, Engines and Systems; Theory of Flight; Flight Instruments; Flight Operations; and Human Factors.

CANADIAN FORCES PILOTS
Canadian Forces pilots who are qualified to wings standards shall demonstrate their knowledge by writing the following Transport Canada multiple choice examination:

<table>
<thead>
<tr>
<th>Examination</th>
<th>Questions</th>
<th>Time Limit</th>
<th>Pass Mark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Law, Air Traffic Rules and Procedures (ARPCO)</td>
<td>30</td>
<td>1 hour</td>
<td>60%</td>
</tr>
</tbody>
</table>

The ARPCO examination is based on subjects contained in the following sections of this Guide: Air Law and Procedures; Navigation and Radio Aids – Pre-Flight Preparation; Navigation and Radio Aids – Other Radio and Radar Aids; Flight Operations – General; and Flight Operations – Aircraft Critical Surface Contamination.

UNITED STATES OF AMERICA PILOT CERTIFICATE TO CANADIAN COMMERCIAL PILOT LICENCE – AEROPLANE
Pilots who hold a United States of America FAA Commercial Pilot Certificate, or Airline Transport Pilot Certificate – Aeroplane, that has not been “Issued on the basis...” of another foreign licence, shall demonstrate their knowledge by writing the following Transport Canada multiple choice examination:

<table>
<thead>
<tr>
<th>Examination</th>
<th>Questions</th>
<th>Time Limit</th>
<th>Pass Mark</th>
</tr>
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<tbody>
<tr>
<td>Commercial Pilot Licence - Aeroplane for conversion from a United States of America Pilot Certificate (FAACA)</td>
<td>20</td>
<td>1 hour</td>
<td>60%</td>
</tr>
</tbody>
</table>

The FAACA examination is based on the differences between FAA and TC air law and communication procedures. Candidates should read the recommended references on pages 25 and 26 as they apply to aeroplanes in VFR operations.
AIR LAW

SECTION 1: AIR LAW AND PROCEDURES
CARs
Some Canadian Aviation Regulations (CARs) refer to their associated standards. Questions from the CARs may test knowledge from the regulation or the standard.

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101 – INTERPRETATION

101.01 Interpretation (Definitions)

103 – ADMINISTRATION AND COMPLIANCE

COMPLIANCE
103.02 Inspection of Aircraft, Requests for Production of Documents and Prohibitions
103.03 Return of Canadian Aviation Documents
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PART II – AIRCRAFT IDENTIFICATION AND REGISTRATION
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202.01 Requirements for Marks on Aircraft

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202.26 Carrying Certificate of Registration on Board

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202.35 General

203 – OPERATION OF A LEASED AIRCRAFT BY A NON-REGISTERED OWNER

203.02 Application
203.03 Leasing Operations - General
PART III – AERODROMES AND AIRPORTS
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300.01 Interpretation

301 – AERODROMES

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401.03 Requirement to Hold a Flight Crew Permit, Licence or Rating
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601.08 VFR Flight in Class C Airspace

601.09 VFR Flight in Class D Airspace

601.10 VFR Flight in Class E Airspace

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601.14 Interpretation

601.15 Forest Fire Aircraft Operating Restrictions

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602.05 Compliance with Instructions

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602.07 Aircraft Operating Limitations

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<td>602.114 Minimum Visual Meteorological Conditions for VFR Flight in Controlled Airspace</td>
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<td>602.138 Two-way Radiocommunication Failure in VFR Flight</td>
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<th>Section</th>
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<td>605.40</td>
<td>ELT Activation</td>
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**AIRCRAFT MAINTENANCE REQUIREMENTS**

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<th>Section</th>
<th>Description</th>
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<td>Inspection After Abnormal Occurrences</td>
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AIR TRAFFIC SERVICES AND PROCEDURES
1 Air Traffic and Advisory Services
2 Flight Service Stations, Flight Information Centres
3 Communication Procedures
4 Radar Service – Clock Position System
5 ATC Clearances/Instructions/ Mandatory Readback Procedures
6 Wake Turbulence Separation
7 Aerodrome Operations – Controlled
8 Aerodrome Operations – Uncontrolled
9 Mandatory and Aerodrome Traffic Frequencies
10 VFR En Route Procedures
11 Procedures for the Prevention of Runway Incursions
12 ESCAT Plan

INTERNATIONAL FLIGHT PROCEDURES
1 Entry, Transit and Departure of Aircraft (TC AIM - FAL 2.0)

OTHER LEGISLATION
1 Canada Transportation Act Part II - Air Transportation Licences, Prohibitions (section 57); Air Transportation Regulations (sections 3 and 7)
2 Canada Labour Code Part II - Occupational Safety & Health, Employee Rights & Duties (sections 126, 127 and 128)
3 Transportation of Dangerous Goods by Air (TC AIM - RAC Annex 3.0)
### SECTION 2: NAVIGATION AND RADIO AIDS

#### DEFINITIONS

1. Meridian
2. Prime Meridian
3. Longitude
4. Equator
5. Latitude
6. Great Circle
7. Rhumb Line
8. Variation
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10. Agonic Line
11. Deviation
12. Track
13. Heading
14. Airspeed
15. Ground Speed
16. Air Position
17. Ground Position
18. Bearing
19. Wind Velocity
20. Drift

#### MAPS AND CHARTS

1. Characteristics of Projections
2. VTA – Transverse Mercator Projection
3. VNC – Lambert Conformal Conic Projection
4. WAC – Lambert Conformal Conic Projection
5. Topographical Symbols
6. Elevation and Contours (Relief)
7. Aeronautical Information
8. Scale and Units of Measurement
9. Locating Position by Latitude and Longitude
10. Navigation Aids
11. Enroute Low Altitude Charts

#### TIME AND LONGITUDE

1. 24 Hour System
2. Time Zones and Relation to Longitude
3. Conversion of UTC to Local and Vice Versa
4. Morning and Evening Twilight Charts

#### PILOT NAVIGATION

1. Use of Aeronautical Charts
2. Measurement of Track and Distance
3. Map Reading
4. Setting Heading – Visual Angle of Departure
5. Check-points and Pin-points
6. Use of Position Lines to Obtain a Fix
7. Ground Speed Checks and E.T.A. Revisions
8. Track Made Good
9. Determining Drift by 10° Lines
10. 1 in 60 rule
11. Double Track Error Method to Regain Track
12. Sum of Opening and Closing Angles to Destination
13. Visual Alteration Method of Correcting to Track
14. Diversion to Alternate
15. Return to Departure Point (Reciprocal Track)
16. Low Level Navigation
17. Deduced (Dead) Reckoning (DR Navigation)
18. In-flight Log and Mental Calculations
19. Procedures When Lost
20. Air and Ground Position
21. Variation/Deviation
22. True Track/Magnetic Track
23. True/Magnetic/Compass Headings
24. Indicated/Calibrated Airspeed (IAS/CAS)
25. True Airspeed/Ground Speed (TAS, G/S)
26. Compass Errors
27. Radio Communications (as per Section 1.)

#### TRIANGLE OF VELOCITIES

1. True Airspeed and Heading
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NAVIGATION COMPUTERS
1 Heading and True Airspeed
2 Applying the Wind
3 True Track and Ground Speed
4 Magnetic Heading and Magnetic Track
5 Pressure/Density and True Altitudes
6 Indicated/Calibrated/True Airspeed
7 Time/Ground Speed/Distance
8 Fuel Consumption and Conversions
9 Climbs/Descents

PRE-FLIGHT PREPARATION
1 Factors Affecting Choice of Route
2 Map Preparation
3 Meteorological Information
4 NOTAM
5 Selection of Check-points
6 Fuel Requirements
7 Weight and Balance
8 Use of Canada Flight Supplement
9 Flight Plans/Itineraries
10 Flight Log Forms
11 Documents to be Carried in Aircraft
12 Aircraft Serviceability

RADIO THEORY
1 Characteristics of Low/High and Very High Frequency Radio Waves
2 Frequency Bands Used in Navigation and Communication
3 Operational Limitations

VHF OMNIDIRECTION RANGE (VOR)
1 Principles of Operation
2 Aircraft Equipment
3 Tuning and Identifying
4 Serviceability Check
5 Interpretation/Orientation/ Homing
6 Intercepting Predetermined Radials and Tracking
7 Position Lines and Fixes
8 Time and Distance Formula
9 VHF (VOR) Airways and Air Routes

AUTOMATIC DIRECTION FINDER
1 Principles of Operation
2 Aircraft Equipment
3 Tuning and Identifying
4 Serviceability Check
5 Interpretation/Orientation/ Homing
6 Intercepting Predetermined Tracks and Tracking
7 Position Lines and Fixes
8 Relative Bearings/ Conversion to Magnetic/True Bearings
9 Time and Distance Formula
10 Inaccuracies/Limitations
11 LF/MF (NDB) Airways and Air Routes

RADIO MAGNETIC INDICATOR (RMI)
1 Basic Principles, Uses and Limitations

GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS/GPS)
1 Principles of Operation
2 Aircraft Equipment
3 Serviceability Checks
4 Interpretation, Orientation and Tracking

OTHER RADIO AND RADAR AIDS – BASIC PRINCIPLES AND USE
1 Distance Measuring Equipment (DME)
2 Transponder
3 Emergency Locator Transmitter
4 VHF Direction Finding (DF) Assistance
5 Surveillance Radar - Primary/Secondary
6 Precision Approach Radar (PAR)
# METEOROLOGY

## SECTION 3: METEOROLOGY

### THE EARTH’S ATMOSPHERE

- Composition and Physical Properties
- Vertical Structures
- The Standard Atmosphere
- Density and Pressure
- Mobility
- Expansion and Compression

### ATMOSPHERIC PRESSURE

- Pressure Measurements
- Station Pressure
- Sea Level Pressure
- Pressure System and their Variations
- Effects of Temperature
- Isobars
- Horizontal Pressure Differences

### METEOROLOGICAL ASPECTS OF ALTIMETRY

- Pressure Altitude
- Density Altitude
- Altimeter Settings
- Considerations when Flying from High to Low Pressure and Temperature Areas, and vice versa

### TEMPERATURE

- Temperature Scale – Fahrenheit/ Celsius
- Heating/Cooling of the Atmosphere – Convection/Advection/ Radiation
- Horizontal Differences
- Temperature Variations with Altitude
- Inversions
- Isothermal Layers

### STABILITY AND INSTABILITY

- Lapse Rate and Stability
- Modification of Stability
- Characteristics of Stable/Unstable Air
- Surface Heating/Cooling
- Lifting Processes
- Subsidence/Convergence

### CLOUDS

- Classification
- Formation and Structure
- Types and Recognition
- Associated Precipitation and Turbulence

### SURFACE BASED LAYERS

- Fog Formation
- Fog Types (Including Mist)
- Haze/Smoke
- Blowing Obstruction to Vision

### TURBULENCE

- Convection
- Mechanical
- Orographic
- Wind Shear
- Clear Air Turbulence
- Reporting Criteria

### WIND

- Definition
- Pressure Gradient
- Deflection Caused by the Earth’s Rotation
- Low Level Winds – Variation in Surface Wind
- Friction
- Centrifugal Force
- Veer/Back
- Squall/Gusts
- Diurnal Effects
- Land/Sea Breezes
- Katabatic/Anabatic Effects
- Topographical Effects
- Wind Shear – Types/ Causes
- Jet Stream – Composition/Altitude/ Seasonal Variance
AIR MASSES
1 Definition and Characteristics
2 Formation/Classification
3 Modification
4 Factors that Determine Weather
5 Seasonal/Geographic Effects
6 Air Masses Affecting North America

FRONTS AND FRONTAL WEATHER
1 Structure
2 Types
3 Formation
4 Cross-sections
5 Frontogenesis/Frontolysis
6 Cold Front
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1 Requirements for Development
2 Structure/Development
3 Types – Air Mass/Frontal
4 Hazards – Updrafts/
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5 Squall Lines

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1 Hazards

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1 Flight Information Centres (FIC)
2 Aviation Weather Web Site
3 Pilot's Automatic Telephone
     Weather Answering Service
     (PATWAS)
4 Automatic Terminal Information Service (ATIS)
5 VOLMET (HF) Broadcast

AVIATION WEATHER REPORTS
1 Decoding
2 Aviation Routine Weather Report (METAR)
3 Automated Weather Observation
     Station (AWOS)
4 Limited Weather Information System
     (LWIS)

AVIATION FORECASTS
1 Times Issued and Validity Periods
2 Decoding
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4 Aerodrome Forecasts (TAF)
5 Upper Wind and Temperature
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     (AIRMET)
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     Warning Messages (SIGMET)

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2 Symbols and Decoding
3 Surface Analysis Chart
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     Information to 500 mb Level
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PILOT REPORTS
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**AIRFRAMES**
- 1. Types of Construction
- 2. Handling/Care/Securing

**LANDING GEAR, BRAKES AND FLAPS**
- 1. Mechanical
- 2. Hydraulic
- 3. Electrical

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- 1. Two/Four Stroke Cycle
- 2. Methods of Cooling
- 3. Principle of the Magneto
- 4. Dual Ignition
- 5. Exhaust System
- 6. Ancillary Controls
- 7. Turbo-charging
- 8. Effects of Density Altitude/ Humidity
- 9. Limitations and Operations
- 10. Instruments
- 11. Principles of Diesel Engines
- 12. Principles of Turbine Engines
- 13. Engine Handling/Care
- 14. Full Authority Digital Engine Control (FADEC)

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- 1. Theory of Operation
- 2. Fuel-Air Mixture/Mixture Controls
- 3. Carburetor Icing
- 4. Use of Carb Heat and Its Effects on Mixture

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- 2. Icing
- 3. Alternate Air

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- 2. Lighting
- 3. Master/Alternator/ Generator Switches
- 4. Ammeter/Load Meter
- 5. Bus Bars
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- 7. Grounding/Bonding

**LUBRICATING SYSTEMS AND OILS**
- 1. Types – Viscosity/Grades/ Seasonal Use
- 2. Purposes
- 3. Methods of Lubrication
- 4. Venting
- 5. Filters
- 6. Pressure Relief
- 7. Oil Cooler

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- 2. Density/Weight
- 3. Additives
- 4. Contamination and Deterioration
- 5. Tank Location
- 6. Venting/Baffling
- 7. Fuel Line – Filters/Drains
- 8. Induction Manifold
- 9. Detonation/Pre-ignition – Causes/Effects
- 10. Vapour Lock
- 11. Fuel Heater
- 12. Primers
- 13. Fuel Management – Ground/Air
- 14. Fuel Handling – Fuelling Aircraft
- 15. Grounding/Bonding

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- 3. Pressurization
- 4. De-icing/Anti-Icing Systems
- 5. Environmental Systems
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2 Newton’s Laws

FORCES ACTING ON AN AEROPLANE
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2 Drag—Induced/Parasite/Profile
3 Relationship of Lift and Drag to Angle of Attack
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5 Weight
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7 Centre of Pressure (C of P)
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4 Wing Tip Vortices
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3 Methods of Achieving Stability, Effect of C of G Position

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3 Relationship Between Effects of Yaw and Roll
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4 Definitions – IAS/CAS/TAS

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1 Principles of Operation
2 Limitations

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3 Variation
4 Factors Adversely Affecting Compass Operation
5 Reading the Compass
6 Deviation
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9 Compass Serviceability Checks
10 Compass Swinging - Frequency/Basic Methods
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➔ 2 Errors/Malfunctions
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4 Power Sources

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➔ 2 Errors/Malfunctions
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5 Partial Panel
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- 1. Pilot-In-Command Responsibilities
- 2. Aircraft Defects/Minimum Equipment List
- 3. Winter Operations
- 4. Thunderstorm Avoidance
- 5. Mountain Flying Operations
- 6. Wildlife Hazards
- 7. Wildlife Conservation
- 8. Collision Avoidance – Use of Landing Lights
- 9. Canadian Runway Friction Index (CRFI)
- 10. Runway Numbering
- 11. VASIS/PAPI
- 12. Approach, Runway and Aerodrome Markings/Lighting
- 13. Obstruction Marking/Lighting
- 14. Units of Measurement and Conversion
- 15. Radio Communications (as per Section 1)
- 17. Wheelbarrowing
- 18. Hydro-planing
- 19. Taxiing
- 20. Effects of Wind/Wind Shear
- 21. Side-slips
- 22. Radio/Electronic Interference, Portable Electronic Devices

#### AIRCRAFT PERFORMANCE
- 1. Lift/Drag Ratio
- 2. Effects of Density Altitude/ Humidity
- 3. Attitude Plus Power Equals Performance – Climb/ Descent/Level Flight
- 4. Normal/Short/Soft and Rough Field Take-offs and Landings
- 5. Ground Effect
- 6. Best Angle of Climb ($V_a$)
- 7. Best Rate of Climb ($V_y$)
- 8. Manoeuvring Speed ($V_s$)
- 9. Maximum Normal Operating Speed ($V_{no}$)
- 10. Never Exceed Speed ($V_{ne}$)
- 11. Maximum Flap Speed ($V_{fe}$)
- 12. Maximum Gear Operating Speed ($V_{lo}$)
- 13. Gliding for Range
- 14. Flying for Range
- 15. Flying for Endurance
- 16. Slow Flight
- 17. Stalls
- 18. Indicated and True Stalling Speed
- 19. Stall Speed vs Altitude
- 20. Spins
- 21. Spirals
- 22. Bank/Speed vs Rate/Radius of Turn
- 23. Effects of Change of Weight or Centre of Gravity (CG) on Performance
- 24. Use of Aircraft Flight Manual (Including Approved and Unapproved Operational Information)

#### USE OF PERFORMANCE CHARTS
- 1. Take-off Charts
- 2. Cross-wind Charts
- 3. Climb/Descent Charts
- 4. Cruise Charts
- 5. Fuel Burn Charts
- 6. Landing Charts
- 7. Performance (V) Speeds – $V_a$, $V_{no}$, $V_{fe}$, $V_{lo}$, $V_{ne}$, $V_s$, $V_x$, $V_y$
- 8. Effect of Ice/Snow/Frost/Slush/Water on Take-off and Landing Run
- 9. Effect of Various Runway Surfaces on Take-off and Landing Run
- 10. Upslope/Downslope Runway
- 11. CFRI Performance Tables and Charts

#### WEIGHT AND BALANCE
- 1. Terms – e.g. Datum/Arm/Moment/MAC
- 2. Locating CG
- 3. CG Limits
- 4. Weights – e.g. Empty/Gross
- 5. Load Adjustment
- 6. Cargo Tie-down/Passenger Loading
- 7. Normal/Utility Category
WAKE TURBULENCE
1 Causes
2 Effects
3 Avoidance

SEARCH AND RESCUE (SAR)
(TC AIM – SAR)
1 Service Available, Request for Assistance, Aiding Persons in Distress
2 ELT (Exclude Categories)
3 Aircraft Emergency Assistance
4 Survival – Basic Techniques

AIRCRAFT CRITICAL SURFACE CONTAMINATION
1 Effects of Aircraft Critical Surface Contamination on Performance
2 Clean Aircraft Concept
3 Frozen Contaminants
4 Cold Soaking Phenomenon
5 Practices for Pilots to Ensure a Clean Aircraft
6 Pre-Take-Off Inspection
SECTION 8: HUMAN FACTORS

AVIATION PHYSIOLOGY
- 1 Hypoxia/Hyperventilation
- 2 Gas Expansion/Trapped Gasses, Effects
- 3 Decompression (Including SCUBA diving)
- 4 Vision/Visual Scanning Techniques
- 5 Hearing
- 6 Orientation/Disorientation (Including Visual/Vestibular Illusions)
- 7 Positive and Negative “G”
- 8 Airsickness
- 9 Body Rhythms/Jet Lag
- 10 Sleep/Fatigue
- 11 Anaesthetics/Blood Donations
- 12 Effects of Smoking

THE PILOT AND THE OPERATING ENVIRONMENT
- 1 Personal Health/Fitness
- 2 Diet/Nutrition
- 3 Medications (Prescribed and Over-the-counter)
- 4 Substance Abuse (Alcohol/Drugs)
- 5 Pregnancy
- 6 Heat/Cold
- 7 Noise/Vibration
- 8 Toxic Hazards (Including Carbon Monoxide)

AVIATION PSYCHOLOGY
- 1 The Decision-Making Process
- 2 Factors That Influence Decision-Making
- 3 Situational Awareness
- 4 Stress
- 5 Managing Risk
- 6 Attitudes
- 7 Workload – Attention and Information Processing

PILOT – EQUIPMENT/MATERIALS RELATIONSHIP
- 1 Controls and Displays – Errors in Interpretation and Control
- 2 Standard Operating Procedures – Rationale/Benefits
- 3 Errors in the Interpretation and Use of Maps/Charts
- 4 Correct Use of Check-lists and Manuals
- 5 Automation and complacency

INTERPERSONAL RELATIONS
- 1 Communications with Flight Crew/Maintenance Personnel/Air Traffic Services/Passengers
- 2 Operating Pressures – Family Relationships/Peer Group
- 3 Operating Pressures – Employer

THREAT AND ERROR MANAGEMENT (TEM)
- 1 Sources, Contributors
- 2 Countermeasures
- 3 Undesired Aircraft State
ENQUIRIES

Information concerning the location of pilot training organizations and matters pertaining to flight crew licensing may be obtained by contacting the appropriate Regional Offices. A complete listing may be found at: http://www.tc.gc.ca/eng/civilaviation/opssvs/general-exams-centres-2010.htm.

RECOMMENDED STUDY MATERIAL

- **When in Doubt… Small and Large Aircraft - Aircraft Critical Surface Contamination Training Booklet (TP 10643)**
- **Aircraft Critical Surface Contamination Examination Questions (TP 10615).**
- **Air Command Weather Manual (TP 9352)**
- **Air Command Weather Manual (Supplement) (TP 9353)**
- **Human Factors for Aviation - Basic Handbook (TP 12863), and Advanced Handbook (TP 12864)**
- **VFR Navigation Charts (VNC)/VFR Terminal Area Charts (VTA)/World Aeronautical Charts (WAC)**
- **Canada Flight Supplement**
- **Enroute Low Altitude Charts**

Transport Canada publications (TP) may be purchased from retailers, or at the following web site: [http://www.tc.gc.ca/eng/publications-order-605.html](http://www.tc.gc.ca/eng/publications-order-605.html)

The Study Guide For The Radiotelephone Operator's Restricted Certificate - Aeronautical (RIC-21) is available free of charge from district offices of Industry Canada - Examinations and Radio Licensing ([http://www.strategis.gc.ca](http://www.strategis.gc.ca)).

Information on the Transportation of Dangerous Goods is available from Transport Canada. ([http://www.tc.gc.ca/eng/tdg/clear-menu-497.htm](http://www.tc.gc.ca/eng/tdg/clear-menu-497.htm))


Information on Customs Requirements is available from the Canada Border Services Agency ([http://www.cbsa-asfc.gc.ca/](http://www.cbsa-asfc.gc.ca/)).


Information on text books and other publications produced by commercial publishers can be obtained through local flying training organization, bookstores and similar sources.

RECOMMENDED STUDY MATERIAL FOR THE FAA CONVERSION EXAMINATION

Candidates attempting the examination for conversion from an FAA certificate to a Canadian Commercial Pilot Licence (FAACA examination) are encouraged to review the following references as they apply to aeroplanes in VFR operations:

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The above documents can be located on the Transport Canada web pages
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