COMMERCIAL GROUNDSCHOOL

End of Course Examination

Farmhall Aviation Training

Version 1.8
A LO5/6 Chart and an Aviation Calculator (e.g., CX-2) are required for the completion of this examination.

Air Law

Q 1 *A flight plan is required for a VFR flight:*

1. if the flight will enter controlled airspace
2. if the flight goes outside a 25 statute mile circle around the departure airport
3. if the flight goes outside a 25 nautical mile circle around the departure airport
4. if the flight is international

4 (a flight plan is needed only for international flights, flights entering the ADIZ or flights to a military airport.

Q 2 *Which of the following statements is/are true?*

A. VFR flight is not permitted in class B airspace

B. Class A, B, C, D and E airspace are all controlled

C. Class F airspace is restricted and can only be entered with the permission of the owner

D. All Canadian airspace between 12,500' ASL and 18,000' ASL is classified as class B

E. All Canadian airspace between 18,000' ASL and FL600 is classified as class A

1. A, C and E
2. B and E
3. D and E
4. B only

4. A is clearly wrong. Class F advisory does not require permission to enter. Class B only exists above other controlled airspace. There is uncontrolled high-level airspace in the Northern Domestic airspace.

Q 3 *How much fuel need a propeller-driven aircraft carry at the beginning of a night VFR flight?*

1. Enough to fly to the destination airport given any anticipated delays and then fly for 30 minutes at normal cruising speed
2. Enough to fly to the destination airport given any anticipated delays and then fly for 60 minutes at normal cruising speed
3. Enough to fly to the destination airport given any anticipated delays and then fly for 45 minutes at normal cruising speed

4. Enough to fly to the destination airport given any anticipated delays and then fly for 30 minutes at best endurance speed

3.

Q 4 *Which of the following statements regarding right-of-way when manoeuvring on water is correct?*

1. When an aircraft approaches another aircraft head-on then it shall turn to the left
2. When an aircraft has another aircraft on its right then it shall give way
3. When an aircraft has another aircraft on its left then it shall give way
4. When an aircraft approaches a boat head-on then it shall turn to the left

2. See RAC1.10 (602.20)

Q 5 *The flight-time limitations for a commercial pilot include:*

1. 1,200 hours in any 365 consecutive days, 300 hours in any 90 consecutive days, 120 hours in any 30 consecutive days or, in the case of a flight crew member on call, 100 hours in any 30 consecutive days.
2. 1,200 hours in any 6 months, 500 hours in any 90 consecutive days, 80 hours in any month or, in the case of a flight crew member on call, 50 hours in any month.
3. 1,200 hours in any calendar year, 300 hours in any 3 consecutive calendar months, 120 hours in any calendar month or, in the case of a flight crew member on call, 100 hours in any calendar month.
4. 600 hours in any 192 consecutive days, 300 hours in any 90 consecutive days, 120 hours in any 30 consecutive days or, in the case of a flight crew member on call, 100 hours in any 30 consecutive days.

1.

Q 6 *Which of the following statements is correct? Where a flight crew member is required by an air operator to travel for the purpose of positioning after the completion of flight duty time, the air operator shall provide the flight crew member with an additional rest period at least equal to . . . :*

1. the time spent travelling that is in excess of the flight crew member's maximum flight duty time.
2. one-quarter the time spent travelling that is in excess of the flight crew member's maximum flight duty time.
3. twice the time spent travelling that is in excess of the flight crew member's maximum flight duty time.
4. one-half the time spent travelling that is in excess of the flight crew member's maximum flight duty time.

4.

Q 7 *No air operator shall operate a pressurised aircraft with passengers on board above . . . unless the aircraft is equipped with oxygen dispensing units and an undiluted supply of first aid oxygen sufficient to provide at least . . . passenger(s) with oxygen for at least . . . hour or the entire duration of the flight at a cabin pressure-altitude above . . . feet, after an emergency descent following cabin depressurization, whichever period is longer.*

1. 12,500, half of the, one, 8000
2. FL250, one, one, 8000
3. 18,000, one, one, 8000
4. 8000, one, one, 10000

2.

Q 8 *The widow of a pilot who has recently died approaches you with the ashes of her dead husband. He expressed a wish that his ashes be dispersed from an aircraft flying over his home airport and she asks you to perform this act. May you legally comply?*

1. no, dropping items from an aircraft in flight is forbidden
2. no, human remains may not be flown in a commercial aircraft without permission of the minister
3. yes, as long as no one on the ground is placed in danger
4. yes, as long as the ashes are scattered from an altitude where they will be blown clear of the airport property

3.

Q 9 *Which of the following most closely matches the regulations regarding a pregnant woman acting as a pilot-in-command? A preganant pilot should not act as pilot-in-command:*

1. between the 30th week of pregnancy and 6 weeks after the birth
2. between the 18th week of pregnancy and 6 weeks after the birth unless the pilot holds an ATPL or higher certificate
3. between the 30th week of pregnancy and 6 weeks after the birth if the pregnancy could impair the pilot's ability to fly safely
4. between the 18th week of pregnancy and 6 weeks after the birth unless the pilot is also an air-traffic controller

3.

Navigation

Q 10 *When departing runway 32 in a Cessna 172 with climb speed of 100 knots with winds 070 Magnetic at 15 knots, the pilot is instructed by ATC to "maintain runway heading" after takeoff. What heading should the pilot fly?*

1. 328° Magnetic
2. 315° Magnetic
3. 140° Magnetic
4. 320° Magnetic

4.

Q 11 *When departing from an airport in the Standard Pressure Region, how shall a pilot set the aircraft's altimeter?*

1. To 29.92" Hg on the ground at the departure airport
2. To airport altitude (or local pressure setting) on the ground and to 29.92" Hg before levelling off at cruise altitude (or 18'000' ASL, whichever occurs first)
3. To airport altitude (or local pressure setting) on the ground and to 29.92" Hg when safely in the air
4. To 29.92" Hg on the ground and to airport altitude (or local pressure setting) before levelling off at cruise altitude

2. RAC2.11: Immediately before levelling out at the *en route* flight level or at 18'000 feet ASL, whichever is the lower.

Q 12 *When flying in the Standard Pressure Region, when should the aircraft's altimeter be set from 29.92" to the setting of the destination airport?*

1. When the airport is in sight
2. Prior to starting a descent for landing
3. When the circuit pattern is reached
4. On the ground at the destination airport

2. Prior to starting a descent with the intention of landing. RAC2.11.

Q 13 *What is a Precision Radar Approach?*

1. an approach offered at a towered airport making use of ATC's secondary radar.
2. any precision approach at an airport with radar in the tower.
3. an approach wherein a controller "talks" the pilot down.
4. an approach which cannot be flown unless the aircraft is fitted with radar.

3.

Q 14 *You are planning a flight from Norman Wells (N65 16, W126 44) to Fort Simpson (N61 46 W121 18), both on the LO5 chart, on the 9th June 2005. At the height that you intend to fly, your groundspeed to Fort Simpson is expected to be 130 knots and, should you have to return to Norman Wells, your groundspeed would be 70 knots. You have sufficient fuel for a 3 hour flight. Given this information, your points of no return and equal return would be:*

1. 136.5nm and 88.9nm from Norman Wells
2. 88.9nm and 136.5nm from Norman Wells

	Local Time		
Date	11:36	11:44	11:52
30 MAY	172.7	175.5	178.2
09 JUN	172.1	174.8	177.6
19 JUN	171.3	174.1	176.8
29 JUN	170.6	173.3	176.1
09 JUL	170.1	172.8	175.5

Table 1: Table for Question 15

3. 136.5nm and 88.9nm from Fort Simpson
4. 88.9nm and 136.5nm from Fort Simpson

1.

Q 15 *On the flight described in question 14, you pass over the Wrigley VOR at 20:00Z. Using the extract from the Sun's true bearing table given in table 1, the sun's true bearing at that moment is:*

1. 174.1°
2. 175.9°
3. 170.1°
4. None of the above: an incorrect portion of the table is given

2.

Q 16 *Consider the LANRK intersection on LO6 (N44 59.5 W76 22.6). How would this intersection most accurately be identified during flight?*

1. by cross radials from the Ottawa (YOW) and Campbellford (YCF) VORs
2. by a bearing from the Kingston (YGK) NDB and a radial from the Campbellford (YCF) VOR
3. by DME distance from the Ottawa (YOW) VOR
4. by cross radials from the Watertown (ART) and Ottawa (YOW) VORs

4.

Meteorology

Consider the following weather reports and forecasts when necessary to answer the questions in this section.

```
METAR CYOW 111600Z 07005KT 4SM BKN004 BKN015 OVC020 04/00 A2965 RMK
SC5SC2SC16
METAR CYPQ 111600Z 10006KT 15SM SCT060 BKN120 OVC220 07/M01 A3053
RMK AC3AC2CI2=

TAF AMD CYOW 111444Z 1115/1212 07006KT P6SM SCT010 BRK030 OVC050
BECMG 1115/1117 09010KT BKN006
RMK NXT FCST BY 18Z=
```

Q 17 *What is the time of issue and validity period of the CYOW TAF?*

1. issued on 11th of the month at 14:44Z and valid from 15:00Z on the 11th until 12:00Z on the 12th
2. issued at 11:14:44Z and valid from 11:00Z until 15:00Z on the 12th
3. issued on 11th of the month at 14:44Z and valid from 11:00Z on the 11th until 15:00Z on the 12th
4. issued on 7th of the month at 00:06Z and valid from 15:00Z on the 11th until 12:00Z on the 12th

1.

Q 18 *What is the meaning of the word* `AMD` *in the TAF?*

1. Air Meteorological Data
2. Air Modification Data
3. Amended
4. American Data

3.

Q 19 *How do the actual conditions reported at CYOW compare with those forecast?*

1. Winds are much stronger and ceiling is lower than forecast
2. Winds and ceiling are very close to those forecast
3. Winds are very close to forecast but ceiling is lower
4. Winds are very close to forecast but ceiling is higher

3.

Q 20 *Which of the following is correct?*

1. Rime icing moves forwards as it collects
2. Rime icing results from flight through large, super-cooled water droplets
3. Rime icing moves backwards as it collects
4. Rime icing cannot form when the temperature is below $-5°C$

1

Q 21 *Which of the following is incorrect?*

1. Hoar frost is caused by sublimation
2. Clear ice spreads backwards as it collects
3. Icing is classified as Trace, Light, Moderate and Severe
4. Icing will collect on blunt surfaces before it will collect on sharp ones

4.

Q 22 *Match the types of fog to their causes.*

1. Radiation Fog
2. Advection Fog
3. Upslope Fog
4. Frontal Fog

1. Precipitation from warm or cold air falls into colder air below.
2. Moist air moves up rising terrain
3. Cooling on clear nights when the relative humidity is high
4. Horizontal movement of warm, moist air over a cool surface

(1,3) (2,4) (3,2) (4,1).

Q 23 *What are the meanings of the following weather descriptors?*

- BR
- DZ
- GS
- FU
- IC
- PL

Mist, Drizzle, Snow Pellets, Smoke, Ice Crystals, Ice Pellets.

Q 24 *The greatest turbulence associated with an active thunderstorm is normally found:*

1. below the cloud base
2. in regions where the temperature exceeds $5°C$
3. in the middle to upper levels of the cell
4. in regions where the temperature is below $-15°C$

3.

Q 25 *You are in an aircraft on the apron at an airport. You may find the pressure altitude of the airport by:*

1. setting the aircraft's altimeter to 29.92 inches and noting the altitude displayed
2. setting the aircraft's altimeter to register the correct airfield elevation and reading the pressure
3. setting the aircraft's altimeter to 29.92 inches, noting the altitude displayed and adding this to the airfield's elevation
4. setting the aircraft's altimeter to 0 (sea level) and reading the pressure

1.

Q 26 *What is the* precise *meaning of the term* `CAVOK`*?*

1. No cloud below 5000' AGL, no CBs, visibility 6 SM or more, no precipitation, thunderstorms, shallow fog or drifting snow
2. No cloud below 5000' ASL, no CBs, visibility 6 SM or more, no precipitation, thunderstorms, shallow fog or drifting snow
3. No cloud below 5000' AGL, no CBs, visibility 6 NM or more, no precipitation, thunderstorms, shallow fog or drifting snow
4. No cloud below 5000' ASL, no CBs, visibility 6 NM or more, no precipitation, thunderstorms, shallow fog or drifting snow

1.

Q 27 *On an upper air chart, contour lines represent points having the same*

. . . ?

1. altitude above sea level in decametres
2. wind speed
3. altitude above sea level in hundreds of feet
4. sea level pressure

1.

Q 28 *Airports A and B are both reporting an altimeter setting of 29.42 inches of mercury. PIREPs indicate that the temperature aloft above A is colder than the temperatures above B. Which of the following statements is true?*

1. The 250 hPa pressure level will be lower over B than over A
2. The 250 hPa pressure level will be the same over B and A
3. The 250 hPa pressure level will probably be at ground level at B
4. The 250 hPa pressure level will be higher over B than over A

4.

Instruments

Q 29 *While flying in IMC a pilot notices that she has not applied pitot heat. What instrument(s) might be suspect?*

1. The altimeter, vertical speed indicator and airspeed indicator
2. The altimeter, heading indicator and airspeed indicator
3. The altimeter, and airspeed indicator only
4. The airspeed indicator only

4.

Q 30 *A pilot is flying at a pressure altitude of 8000 feet and the outside air temperature is* $-10°C$*. His calibrated airspeed is 96 knots, what is his true airspeed?*

1. 86 knots
2. insufficient information is given to allow the true airspeed to be determined
3. 106 knots
4. 125 knots

3.

Q 31 *Which of the following is not normally indicated on the face of an airspeed indicator?*

1. V_{ne}
2. V_a
3. V_{fe}
4. V_{no}

2.

Q 32 *A Piper Cherokee 180 is flying due east when the pilot pulls carbureter heat on. What effect will this have on the magnetic compass?*

1. The compass registers a turn to the north
2. The compass registers a turn to the south
3. The compass registers a turn to the east
4. The compass registers a turn to the west

2.

Q 33 *A pilot is flying to an airport which is reported to have a magnetic variation of* $15°W$*. He lands and stops on runway 34T. What will his compass be reading?*

1. 355°
2. 325°
3. 340°
4. 370°

1.

Q 34 *What effect does an acceleration have on a normal attitude indicator?*

1. It registers a turn to the east
2. It registers a climb
3. It registers a descent
4. It is not affected

2.

Q 35 *Which of the following statements is true?*

1. the altitude transmitted by a mode C transponder is determined by the altimeter setting
2. mode C transponders only transmit the 4 digit code, a mode S transponder is needed to transmit altitude information
3. mode C transponders can be interrogated by TCAS systems
4. mode C transponders continuously transmit the transponder code and altitude of the aircraft

3.

Q 36 *Which of the following statements is true?*

1. a stormscope measures the distance of a thunderstorm by timing the difference between the reception of the lightning strike and the thunder
2. a stormscope only displays areas where rain is falling
3. a stormscope displays areas of virga better than areas of convective activity
4. a stormscope detects static-electrical discharges

4.

Navigation Systems

Q 37 *What is the guaranteed accuracy of a VOR radial?*

1. Published radials are accurate to within 3°, there is no bound on the error on other radials
2. Published radials are accurate to within 4°, there is no bound on the error on other radials
3. Published radials are accurate to within 3°, other radials are accurate to within 6°
4. All radials are accurate to within 3°

1.

Q 38 *How may the accuracy of an onboard VOR receiver be checked?*

1. by using a VOT and checking that the receiver displays 360° and 180° to within ±6°
2. by comparing two VOR receivers within the aircraft tuned to the same transmitter and checking that they agree to within ±4°
3. by using a VOT and checking that the receiver displays 360° and 180° to within ±3°
4. by flying over a landmark under a published radial and checking that the receiver displays the radial within ±4°

2. At an airport equipped with a VOT, the pilot can tune this and centre the needle. The VOR should then read 360° FROM or 180° TO within ±4°.

In an aircraft with two VOR receivers, these may be checked against each other. A difference of more than 4° indicates that the VORs may not be used.

Some airports have designated VOR Check Points. When at these points the VOR should read within ±4° of the posted radial.

When en route the aircraft may be flown over a landmark located on a published radial. In this case a tolerance of ±6° is allowed. COM3.5.

Q 39 *VOR A lies directly to the north of VOR B. A pilot flying southwards has tuned and correctly identified both using her two VOR receivers. VOR A is shewing a centred track bar (CDI needle) with a FROM flag when the OBS is set to 280. At the same time, the OBS for VOR B is set to 270. What flag is being shewn on VOR B and to which side is the track bar deflected?*

1. FROM, LEFT
2. FROM, RIGHT
3. TO, LEFT
4. TO, RIGHT

1.

Q 40 *ADF night effect is:*

1. most pronounced when the sun is at its lowest point below the horizon
2. caused by the ADF receiver tuning to the ground wave rather than the sky wave
3. caused by the radio waves created by cosmic rays hitting the ionosphere
4. caused by sky waves interfering with ground waves

4.

Q 41 *Which of the following statements regarding VHF and LF low-level airways is false?*

1. VHF airways are 8 nm wide either side of the centre line to a distance of about 51 nm and then spread at 9°.
2. LF airways are 10 nm either side of the centre line to a distance of about 50 nm and then spread at 10°.
3. VHF airways are 8.68 nm wide either side of the centre line to a distance of about 50 nm and then spread at 9°.
4. LF airways are 8.68 nm either side of the centre line to a distance of about 50 nm and then spread at 10°.

3. VHF airways are 8 nm wide out to a distance of 51 nm from the VOR and then spread at 9° (4.5° either side of the centre line). LF airways are 8.68 nm wide out to a distance of 50 nm from the NDB and then spread at 10°. RAC 2.7.1.

Q 42 *A DME is most accurate when:*

1. flying to a distant station at low altitude
2. flying from a nearby station at a high altitude
3. flying on an easterly heading while south of the station
4. flying directly over a station while descending rapidly

1.

Q 43 *Which of the following can GPS not provide?*

A. heading
B. altitude
C. track
D. air speed
E. ground speed

1. A and D
2. A, B and D
3. The GPS can provide all of these items
4. D

1.

Q 44 *Which of the following statements about GPS is not true?*

1. The GPS satellites are geo-stationary
2. The wide-area augmentation system (WAAS) makes use of geo-stationary satellites
3. RAIM errors can occur even if more than five GPS satellites are above the horizon
4. GPS can measure an aircraft's altitude as well as its latitude and longitude

1: the GPS satellites are *not* geo-stationary.

General Knowledge

Q 45 *The strongest wing-tip vortices are caused by . . . aircraft moving . . . in a . . . configuration.*

1. heavy, slowly, clean
2. light, quickly, landing
3. heavy, quickly, landing
4. heavy, slowly, landing

1.

Q 46 *A pilot is flying with the turn coördinator indicating a rate 1 turn to the right and the inclinometer ball at the right-hand end of its possible travel. What is the aircraft doing?*

1. it is accelerating
2. it is skidding
3. it is descending
4. it is in coördinated flight

1. This question seems to give both students and instructors a problem. I have even had it claimed that it is "unfair": the answer must be "it is slipping"! When I gently point out that that is not an option given there is a tendency to give up. Note that it is important for students to understand that when an aircraft is turning, it is accelerating. This is essential for the correct understanding of the forces acting on an aircraft in a turn.

Q 47 *Which of the following is true regarding a supercharger and a turbocharger?*

1. a turbocharger has an engine-driven compressor
2. a supercharger is more efficient as no engine power is lost in driving the compressor
3. a turbocharger compresses the air/fuel mixture
4. opening the wastegate causes the engine to be normally aspirated.

4.

Q 48 *Aircraft A is travelling at 100 knots and aircraft B at 150 knots. They start a rate one turn to the left at the same time. Which of these statements is not true?*

1. both aircraft have the same rate of turn
2. aircraft A's bank angle is lower than aircraft B's
3. aircraft A's radius of turn is greater than aircraft B's
4. both aircraft will complete a 180° turn at the same time

3.

Q 49 *You are about to take off from runway 32 at Ottawa International and tower has told you that the winds are 270 at 20 knots. Using the diagram in figure 1 or otherwise determine the headwind and crosswind components of the wind.*

1. 13 knots crosswind from left, 15 knot tailwind
2. 13 knots crosswind from right, 15 knot tailwind
3. 15 knots crosswind from left, 13 knot headwind
4. 13 knots crosswind from left, 15 knot headwind

3.

Q 50 *You are flying an aircraft with constant speed propeller of the counter-weight type. If propeller oil pressure is lost in flight then:*

1. the propeller will stop turning
2. the propeller will go into fine pitch
3. the propeller will go into coarse pitch briefly and then into feather

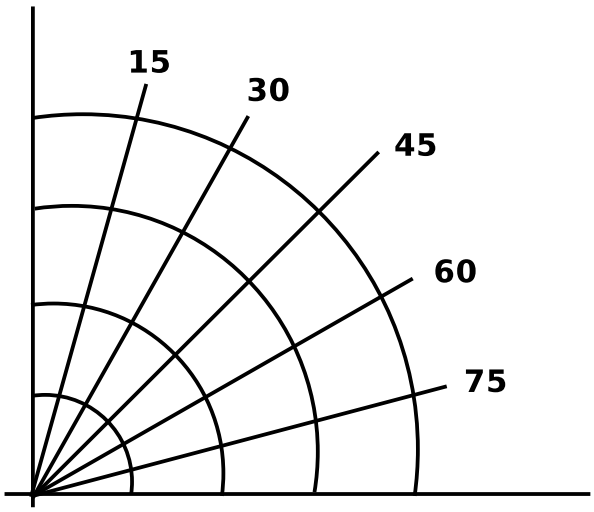

Figure 1: Cross-Wind Calculator for Question 49

4. the propeller will go into coarse pitch

3.

Human Factors

Q 51 *What are the symptoms of hyper-ventilation and how should this condition be treated?*

1. There are no symptoms other than a mild sense of euphoria. Should be treated by descending immediately.
2. Tingling of the extremities. Should be treated by slowing down the breathing.
3. There are no symptoms. Should be treated by opening the windows of the aircraft and ensuring that all other ventilation is turned off.
4. Tingling of the extremities. Should be treated by the Valsalva technique.

2.

Q 52 *You are used to flying from a small, rural airport with a 3000ft × 75 feet runway. You are making an approach into a large international airport. What visual illusion might you encounter?*

1. An illusion of being too low, causing the approach to be too high.
2. An illusion of being too low, causing the approach to be too low.
3. An illusion of being too high, causing the approach to be too high.
4. An illusion of being too high, causing the approach to be too low.

1.

Q 53 *Transport Canada recommends the "DECIDE" model for decision making. For what do the letters of DECIDE stand?*

1. Determine, Estimate, Choose, Isolate, Do, Evaluate
2. Detect, Evaluate, Choose, Identify, Do, Estimate
3. Detect, Estimate, Choose, Identify, Do, Evaluate
4. Decide, Estimate, Choose, Isolate, Do, Evaluate

3.