

PPL TECHNICAL EXAMINATION (Aeroplanes Section 6g)**06/99**

Associated with the Skills Test is the PPL Technical Examination Aeroplanes Section 6g – this is colloquially known as the ‘tech oral’. The subjects concerned are listed on the CAA Examination sheet FCL 112. They all apply to the specific aircraft type (used on the Skills Test) and comprise:

Pilot Maintenance, including Duplicate Control Inspections

Airframe Limitations, including Weight and Balance

Weight and Performance, plus practical calculations

Range and Endurance

Flying Controls and Flaps

Landing Fee

Electrical System

Heating and Ventilation

Flight Instruments, Vacuum & Pitot / Static Systems

Engine & Controls

Fuel System

Oil System

Propeller

Hydraulics (Brakes)

De-icing/Anti-icing (Pitot Head Heater)

Sources of reference include BCAR’s and ANO General Regulations for information re Pilot Maintenance and the Cessna 152 Flight Manual for the other subjects. Typical questions are given below:

- 1) In what circumstances may a qualified pilot maintain or repair an aircraft? Or is it not permitted at all?
- 2) What is a duplicate inspection? Who normally makes duplicate inspections? May a pilot make such an inspection?
- 3) In what performance group is the Cessna 152 classified?

- 4) For what flight condition is the aircraft categorised? Are there any temperature limitations or G-Limitations?
- 5) What is the max AOW of the aircraft? Any limitations on baggage weight?
- 6) What V-speeds relative to the Cessna 152 do you know?
- 7) May the aircraft be flown in light icing conditions?
- 8) If the aircraft can be allowed to take off at max AOW, is it permissible to land the aircraft at such a heavy weight?
- 9) When you get your PPL and you are permitted to carry passengers, would you warn any lady passengers regarding unsuitable footwear? What sort of footwear, and why?
- 10) Regarding performance, what maximum length of grass would you consider safe for take-off, assuming all other considerations were satisfactory?
- 11) What is the maximum permitted cross-wind component for this aircraft?
- 12) Calculate the take off distance for the aircraft at maximum AOW at Dunkeswell, temp 20°C, using 30° flap on short wet grass, nil wind?
- 13) If you had to orbit for a very long time to allow fog to clear and had to conserve fuel, how would you operate the aircraft? List four ways, including the power setting?
- 14) If you had to fly the aircraft to achieve maximum miles per gallon used, how would you operate your aircraft? List four ways, including power setting?
- 15) Is the elevator control fitted with a trim tab? What sort?
- 16) If the trim wheel position indicator became lost, what would you do? Assuming the aircraft could be cleared for flight how would you find the neutral position?
- 17) What design features are embodied in the ailerons?
- 18) How would you know, if you had no flight manual?
- 19) How would you secure the flying controls against the wind if the aircraft was parked in the open in stormy conditions?
- 20) What type of flaps are fitted?
- 21) In the air, why shouldn't they be lowered in a turn?
- 22) After retracting the flaps, in the air or on the ground, what simple check should be made?
- 23) Why shouldn't you make a habit of testing flap operation with the aircraft parked tail to wind?
- 24) How are the landing shocks / loads transmitted to the structure?

- 25) What is the angular travel of the nosewheel with and without differential brakes?
- 26) The aircraft tyres are normally equipped with creep marks. How much 'creep' is permitted?
- 27) If the creep had reached the maximum permitted and you were away from base, what secondary rudimentary check could you make to check the state or likely state of the tyre and tube?
- 28) If you were pre-flighting an aircraft and couldn't see any creep marks at all, what might be your conclusion? What would you do?
- 29) What tyre pressures are recommended for the mainwheels and nosewheel, respectively? If you didn't know these figures, where could you find the information other than in the Flight Manual?
- 30) Why doesn't the aircraft trail an earthing tag to shed static electricity?
- 31) What tyre defects might you find during a pre-flight inspection?
- 32) What is the safe accepted oleo extension for the Cessna 152 nose landing strut?
- 33) What are the dangers of taxiing or flying the aircraft with a low nose oleo?
- 34) If you move the rudder pedals in flight does the nosewheel move in sympathy?
- 35) Could this give a problem when landing in a strong crosswind
- 36) How can you obtain the smallest turning circle when taxiing?
- 37) If during landing the tail bumper struck the ground, what post flight action should be taken?
- 38) If you had to push the aircraft into a restricted space in the hangar what precautions would you take, and what special piece of equipment would you ask for? How does this fit on the aircraft?
- 39) So, what is the wing span of the aircraft?
- 40) What type of brake is fitted to the aircraft? E.g. drum or disc? Is an anti-skid device fitted?
- 41) What is the stated voltage of the electrical system?
- 42) Is an alternator or generator fitted?
- 43) When the engine is running, how can you confirm the state of the battery?
- 44) After starting the engine it is common to see a charge rate when the alternator is switched on. This could be as high as +30 amps. After about a minute the rate must fall to an acceptable figure. What is a safe figure?
- 45) What would you do if the figure doesn't fall? Why?
- 46) If in flight the figure falls to zero, what would you do?

- 47) How could you confirm that the alternator is still working satisfactorily?
- 48) What would tell you if an alternator has failed? What should you do?
- 49) What is the rated battery capacity? What does this mean?
- 50) When you turn the Master Switch off? Does this turn all the services off?
- 51) What is likely to happen if you leave the Master Switch on when you walk away from the aircraft?
- 52) Can you think of a way to obviate this?
- 53) Is it permissible to switch off the master switch if the alternator still running?
- 54) What would you do if a circuit breaker trips?
- 55) Is it permissible to hold a circuit breaker in to restore a circuit if it repeatedly trips?
- 56) In the event of an aircraft battery being completely flat is it permissible to hand-swing the propeller on the assumption that the battery will top up?
- 57) Where is the battery stowage?
- 58) Is the Cessna 152 fitted with an external ground power supply
- 59) Is the stall warner electrically operated, or is it of the reed type?
- 60) What is the heat source for the aircraft heating system?
- 61) How is the cabin heat selected?
- 62) Could carbon monoxide find its way into the cockpit via the heating system? How?
- 63) What would a pilot do to minimise such effects?
- 64) What is the source of the cold air supply to the cockpit? How is this controlled / directed?
- 65) How should the above controls be set in the event of engine or cabin fire?
- 66) List the main flight instruments, which are gyro-operated and which are operated by the suction system?
- 67) Are the gyro instruments operated by suction or electrically?
- 68) What provides the source of suction?
- 69) How does the pilot know if the source of vacuum (suction) is adequate?
- 70) Where are the following items located?

- a) Pitot Head b) Static Vent

- 71) Is an alternate static source provided?
- 72) What will happen to the flight instruments if the pitot head becomes blocked with ice or mud?
- 73) What will happen to the instrument readings if the static vent becomes blocked with ice? Any remedies available to the pilot in the air?
- 74) Can anything be done by the pilot to prevent the static vent and / or pitot head from being blocked by ice?
- 75) What grade of fuel is approved for the Cessna 152 engine?
- 76) What make / type of engine is fitted to the aircraft?
- 77) Any special precautions to be observed when refuelling the aircraft?
- 78) What and where are fuel drains and vents?
- 79) With full fuel, what is the aircraft endurance at, say 85k?
- 80) Is the engine air-cooled or liquid cooled?
- 81) How many cylinders are there in the engine?
- 82) Why should a visual check of fuel contents be made when we have a fuel contents gauge?
- 83) When the pilot has removed the fuel filler cap, what points should be checked?
- 84) When you check the fuel at the fuel drain, what are you looking for?
- 85) When should you check the fuel at the fuel drain?
- 86) What is probably the most important aspect of the fuel check?
- 87) Putting in too much oil in the engine is undesirable. Between 5 US Qts and 6 US Qts is about right for a local flight?
- 88) Do we use W80, W100 or W120? Or could we use all three at various times?
- 89) Lubrication is a form of engine cooling. How do we cool the oil?
- 90) Is the engine wet sump, or dry sump?
- 91) How is fuel priming of the engine achieved?
- 92) What should the pilot do if he suspects there is an intake fire when starting up e.g. especially in the wintertime?

- 93) State briefly how you would lean the mixture when flying the aircraft in the cruise?
- 94) Could you lean the mixture in the climb?
- 95) Is it permissible to use partial carburettor heat to prevent carb icing?
- 96) Which throttle position is most likely to cause carburettor icing?
- 97) What would indicate to a pilot, whilst sitting in the aircraft, even before starting the engine, that potential carb icing conditions exist?
- 98) If the engine stops in flight what instruments will stop indicating, and what services will be lost to the pilot?
- 99) If an engine stops in flight, what immediate steps should be taken by the pilot to restart / troubleshoot?
- 100) What are the max. permitted engine RPM? Why?
- 101) In an emergency, may this figure be exceeded?
- 102) When carrying out a magneto 'dead cut' check after starting up, but before making a power check, what precisely should the pilot be looking for?
- 103) When carrying out a magneto check at 1700 rpm prior to departure, which would be more acceptable: a drop of 100 rpm on each magneto or no drop at all?
- 104) Why is it safer when checking the magnetos during the power check to switch the key 'both – right – both – left' i.e two to the left, two to the right, one to the left, one to the right, rather than the sequence: one to the left, one to the right, two to the left, two to the right?
- 105) Why do we check the propeller blades for nicks and cuts when carrying out pre-flight check?
- 106) If you had to manoeuvre the aircraft on the ground by hand, how would you do it?
- 107) How could you make a reasonable assessment of the fuel contents as a cross check on the gauge indications?
- 108) Where are the elevator mass balance weights located?

P.S. what is the inspection that is never called for? Never mentioned in checklists etc but is most important?

Answer: Security of attachment of the safety harnesses.