

GLIDING NEW ZEALAND

ADVISORY CIRCULAR

PILOT EXAMINATIONS

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1. Introduction

- 1.1 This Advisory Circular provides guidance on the following:
- A Certificate oral examination questions.
The model answers to the A Certificate questions.
 - B Certificate oral examination questions.
The model answers to the B Certificate questions.
 - Sample test papers for the Qualified Glider Pilot examinations complete with answers. (to be issued)

2. Oral Examinations

- 2.1 Oral examinations are used to test applicants for issue of the A and B Certificates.
- 2.2 A question bank and model answers for each of these examinations is to be freely available to students for study purposes. From this, ten questions from each section will be chosen by the examining instructor on the day. The student is to answer in a manner that shows understanding of the subjects questioned to be considered to be answering correctly.

3. Written Examinations

- 3.1 Written multi choice examinations are used to test applicants for the Qualified Glider Pilot Certificate and some other endorsements eg. for Motor Glider operations.
- 3.2 Each multi choice question shall have 4 answer options of which only one is completely correct.

4. Pass Mark

- 4.1 The pass mark required for all GNZ examinations is 70%. Correctly answering 7 out of the 10 questions asked in each section of an examination is therefore deemed a pass.

5. A Certificate Questions on Basic Theory

1. Why and what are you checking under "Ballast" in the Pre Takeoff check?
2. What happens to the glider's stall speed in a turn?
3. What is the "Safe Speed Near The Ground" in a TO kt breeze in your glider?
4. What is aileron drag and how do you and the glider's designer compensate for it?
5. Why is it important to clean the glider prior to flight?
6. What happens to the glider's stall speed with the brakes out?
7. What are the symptoms of the Basic Stall?
8. What is the primary function of the airbrakes?
9. How does airspeed affect control effectiveness and response?
10. What force turns the glider?
11. What affects the landing performance of a glider?
12. What is adverse yaw and how is it corrected?
13. What is "Induced Drag" and when is it greatest?
14. What is the significance of the "Minimum Cockpit Load" for your glider?
15. What is the method of checking the glider is trimmed for flight?
16. What is the secondary effect of rudder?
17. What causes the pre stall buffet warning?
18. Why is any damage to the "D" nose section of the wing critical to airworthiness of the glider?
19. On a glider fitted with an elevator trim tab, which way will the tab move if the trim lever is moved forward?
20. If the glider's wing drops at the stall, what is the correct action on the part of the pilot?
21. A glider flying at 60 kts into a 10 kt headwind will have a ground speed of what?
22. What are the 3 primary flight controls and the axis of movement they operate about?
23. What is the correct recovery action from a fully developed spin?
24. What action is necessary to unstall a glider?
25. What 3 forces act on the glider in flight?
26. What is the difference between slip and skid?
27. Why does the glider want to over bank when set in a turn?
28. What is the difference between Indicated Air Speed (IAS) and Groundspeed (G/S)?
29. Why does the nose of the glider pitch down at the stall?
30. Why is there a Maximum Aero Tow and a Maximum Winch Launch speed?

6. A Certificate Questions on Airmanship

1. **What** do you do if you find the rope does not detach when you try to release from tow?
2. What are the cloud base and visibility requirements for flight in Visual Meteorological Conditions (VMC) at your field?
3. Who gives way when two gliders are approaching each other (a) head-on (b) on converging headings?
4. What is the "clock code" and when is it used?
5. Where should your left hand be during take-off?
6. What action do you take if running out of height in the circuit?
7. How should the glider be left after a flight if no one is ready to fly it next?
8. Who can stop a launch from proceeding?
9. On which side does a glider overtake another glider (a) when hill-soaring, (b) at all other times?
10. When doing the HASELL check prior to stalling, what do you check under the
11. Who establishes the direction of turn in a thermal?
12. What are the vectors on your home field?
13. What is the recommended minimum length of rope to be used for ground towing a glider?
14. Why should you not rely on your altimeter to judge your height in the circuit?
15. What precautions should you take when cleaning a glider canopy?
16. Why should you not fly when you have a head cold?
17. Assuming that the glider is not taking off or landing, what is the minimum height to fly over a built-up area?
18. What is the pilot's first priority immediately following a launch failure?
19. The recommended time from alcohol consumption to flying a glider is what?
20. What details of your glider flights do you have to log?
21. How do you check the serviceability of the tow rings prior to a launch?
22. What is the caution with self medication and flying?
23. What is the phonetic alphabet and how is it used for giving your gliders call-sign by radio?
24. Describe the procedure for handing over control of the glider when in flight.
25. What are you checking under the "Straps" part of the Pre Landing Checks?
26. What are your actions if your speed is too slow on a winch launch?
27. What are your actions if you are too fast on a winch launch?
28. What are your actions if a vehicle drives out onto the area you had intended to land on when you are on final approach?
29. What should you do if the towplane gives you the Rudder Waggle signal?
30. What action does a pilot take before carrying out intentional stalling, spinning, or before aerobatics?

7. A Certificate Model Answers for Basic Theory Questions

1. To ensure the cockpit loading is within the Minimum to Maximum allowable weight range so that the glider is operated within its certified Centre of Gravity (CofG) range. We check that if ballast weights are required, that the correct amount has been properly fitted and secured. If not required, we check that they are not fitted.
2. It increases, because of the increase in effective weight due to an increase in the "G" loading.
3. Stall speed for your glider at your weight, plus 10, plus half the wind velocity, so for a glider that stalls at 38 kts, add 10 plus 5 and you get 53 kts as a safe speed in this example.
4. A down-going aileron causes an increase in induced drag, resulting in yaw away from the direction of intended turn. This is called adverse yaw. The most common fix designers use is differential ailerons that have more upward travel than downward travel. The pilot is still left with the task of ensuring sufficient rudder is applied in coordination with the aileron application when rolling into a turn. Look at the types of aileron control on gliders at your site.
5. Cleaning removes any surface irregularities like dust, bugs, dirt etc that will create unwanted airflow disturbances that reduce lift and increase drag (and increase the gliders stall speed). All of this reduces the lift/drag ratio.. your glide performance.
6. It increases by 2 to 5 knots, depending on the type of glider and amount of brake extended.
7. Slightly higher nose attitude than the normal glide, with reducing airspeed as a result; reducing control effectiveness, because of the reduced airflow over them; change in the sound of the airflow, usually getting quieter as less flow around the cockpit as speed reduces; light buffet as turbulent airflow separates from the wing and strikes the fuselage and tailplane surfaces.
8. To control rate of descent, by increasing it when required; ie. on approach.
9. As speed increases, control effectiveness increases. ie. for the same amount applied the response is greater, so less input is required to get the same response as that of a slower speed. The controls also feel heavier when applied at higher speed.
10. Lift. When the glider is banked, using aileron to roll it, the lift force is tilted in the direction of the turn.
11. Approach speed flown; amount of airbrake used; wind strength and direction; surface condition ie. grass short or long, wet or dry, ground hard or soft; tyre inflation; wheel braking.
12. Yaw in the opposite direction to the intended direction of turn, caused by aileron drag. Countered by the coordinated application of rudder and aileron when rolling into a turn.
- 13, Drag induced whenever the wing is generating lift. It is greatest when lift is greatest, ie. at high angles of attack, at low speed.

14. This is the minimum load required in the front seat to keep the glider operating within its certified C of G range. If the loading is too light, the C of G will be aft of the limit and elevator control effectiveness will be reduced to a point where if the glider was to stall, full forward elevator may be insufficient to reduce the angle of attack required for recovery.
15. Set an attitude for the speed you wish to be flying at, then gently relax your grip on the control column. If there is any tendency for the nose to pitch up or down, you are not correctly trimmed.
16. Roll caused by the outer wing travelling faster than the inner wing.
17. Turbulent air flow striking the rear of the wing, the fuselage and tail surfaces and buffeting them.
18. The D nose section forward of the main spar provides strength to withstand the torsional twisting loads imposed on the wing in flight. Damage to this section can greatly reduce the structural integrity of the wing.
19. Up. See a K-13 and some Grob 103's
20. Stick forward and use only enough rudder to prevent yaw.
21. 50Kts.
22. Elevators pitch about the lateral axis; Ailerons roll about the longitudinal axis and Rudder yaws about the vertical axis.
23. Apply full rudder opposite to the direction of rotation, stick forward until the glider stops spinning, then centralise rudder and recover from the dive.
24. Reduce the angle of attack below the stalling angle, usually achieved by moving the stick forward.
25. Lift, Drag and Weight.
26. Slip is a sideways motion towards the lowered wing while skid is the sideways motion towards the higher wing. If the wings are level, any sideways motion is skid.
27. The outer wing is travelling faster, therefore generating more lift which wants to roll the glider further into the turn.
28. Indicated Air Speed is the actual speed of the glider through the air while Ground Speed is its speed relative to the ground. The two are only the same in still air at low level.
29. At the point of stall and beyond the critical angle of attack, the lift force acting through the centre of pressure reduces and moves aft. This change to the balance of forces acting on the wing has a net result of creating a nose down pitching moment.
30. These speeds protect the glider from forces generated by higher speeds that may overstress the release attachment structure as well as the whole glider.

8. Model Answers to the Airmanship Questions

1. Operate the release again; advise the tow plane by radio if fitted, otherwise fly out to the left of the tug and rock your wing, await acknowledgment then return to the normal tow position; expect to be released back near the airfield, over clear land in case the rope releases when released from the tug end; try releasing again to get rid of the rope once off tow; assume you still have the rope trailing unless positively advised of it having released and plan your final approach accordingly to clear obstructions.
2. At an uncontrolled airfield: 600 ft cloud ceiling and 1500 meter visibility; At a controlled airfield: 1500 ft cloud ceiling and 8km visibility unless granted Special VFR in which case the requirements are to remain clear of clouds with at least a 600 ft ceiling and a visibility of 1500 meters.
3. Head on, both gliders turn right; converging, the glider that has the other on its right gives way.
4. Imagine an analog clock face superimposed on the glider where ahead is 12 o'clock, the right wing is at 3 o'clock, the tail is at 6 o'clock and the left wing is at 9 o'clock.. Use this to describe direction; a glider off your right wing is in your 3 o'clock; a town in front of you is in your 12 o'clock... and add an estimated distance and a relative height ie. high, low or same level, to help describe the position relative to yours.
5. Resting on your left leg in easy reach of the release should it be needed.
6. Adjust your aiming point and modify your circuit to land safely in the best available area.
7. Power off; brakes held open and canopy closed; remove off the active vector and picket securely if windy.
8. Anyone who sees a potential hazard to the launch developing.
9. When ridge soaring, overtake on the downwind side between the glider and the hill side. Pass between the glider and the ridge if at the same level or well clear above and below or to the upwind side if there is insufficient room to pass on the inside. At all other times, overtake on the right.
10. A is for Airframe and you check the configuration you want for the particular stall you intend doing; the position of flaps, brakes and undercarriage as required.
11. The first glider in the thermal unless local rules specify a direction as is often the case at a contest.
12. Determine these for your home field. Eg. Omarama is 09 / 27.
13. Half the glider's span; to ensure it can not strike the tow vehicle if it swings out of control of the wing walker.
14. The altimeter measures height above a set datum; usually above sea level. It does not measure height above the ground and is prone to errors that make it too inaccurate for total reliance in circuit height planning.
15. Use a clean soft cloth or moistened chamois, ensuring you do not have any hard

16. Any cold is likely to be accompanied by some infection and inflammation of the eustachian tube and inner ear tissues which could be further irritated and damaged by the pressure changes that occur with flying at even low levels. The inner ear balance organs may also be adversely affected and this will reduce the pilot's ability to remain spatially orientated in flight.
17. 1000 ft above the highest obstacle within a horizontal radius from the glider of 2000 ft.
18. Lower the nose to attain Safe Speed Near The Ground.
19. 12 hours.
20. As per the GNZ Logbook; date, registration, duration of flight, dual / solo, type of launch.
21. Inspect for cracks visually and by rattling to hear a jingle / ring. Feel for any cracks or damage and visually check ring shape is not distorted by previous overstress. Rotate the big ring through the rope to ensure any damage is not hidden by the rope.
22. Generally a no- no as most medications are for use on the ground and are not suitable for pilots as they dull the body's sensors used for orientation. Check any medication with an aviation qualified doctor ensuring he realises you are wanting to fly as pilot in command and not just as a passenger.
23. Alpha, Bravo, Charlie, Delta.... GNX is "Golf November Xray" or "Glider November Xray"
24. Pilot flying says "You have control", waits for the other to place hands and feet on the controls and when ready says ~ have control" before letting go of the controls. If a pilot wants to take control from the other, they say, "I have control" as they place hands and feet on the controls; the flying pilot then releases control saying "You have control".
25. Straps are prone to working loose in flight, partially as a result of your "settling" in the seat and partially from your movement working against them. On longer flights, loss of body weight will also cause them to be loose. Tightening them ensures your full protection on landing.
26. Lower the nose and release if the speed does not increase.
27. Lower the nose, waggle the rudder to signal you are too fast but release if still too fast.
28. Close the brakes and re establish an approach to a new aim point in a clear area beyond the vehicle, then use the brakes again as required.
29. Check your brakes are closed; if open, close them ensuring you maintain the normal tow position.
30. Complete the Pre Manoeuvre Checks; Height, Airframe, Security, Engine, Location and Lookout.

9. B Certificate Theory Questions

1. What happens to the rate of descent in a turn?
2. What is "Aspect Ratio" and why is it significant?
3. What is "Laminar Flow"?
4. A glider always stalls at the same what?
5. What effect will slip have on the stall speed?
6. How do you recognise a spiral dive from a spin?
7. What is "lateral damping"?
8. what effect do rain drops have on a wing and what action do you take to compensate?
9. How much control can you use at Maximum Rough Air Speed (VR)?
10. what is the significance of the gliders Minimum Sink speed?
11. Define "Wing Loading" and why is it significant?
12. How does True Air Speed (TAS) differ from Indicated Air Speed (IAS)?
13. what kind of stability does a glider have in the yawing plane?
14. How does the yaw string work?
15. How much does the stall speed increase by in a 60 degree banked turn?
16. How do the symptoms of an approaching stall with the brakes out differ from those of the basic stall?
17. where do you set the Trim when doing the Pre Take-off checks?
18. How can gusts stall the glider?
19. what are "Speed Limiting Airbrakes"?
20. what contributes to the Profile Drag of a glider?
21. What is "Auto rotation"?
22. The longer a glider has been spinning, the longer it will take to recover. True / False?
23. why is rudder the first recovery control input for a spin?
24. How do you get reduced or negative G in a glider?
25. what are the hazards of flying with a cockpit weight above the maximum allowed?
26. How does wind gradient differ from wind shear?
27. what determines the amount of sideslip a glider is capable of?
28. what is a "stabilised approach"?
29. what is the danger of banking too steeply near the ground in windy conditions?
30. Is the lull load carried by the wing during a winch launch felt as G by the pilot?

10. B Certificate Airmanship Questions

1. Who has priority, a glider taking off or a power aircraft landing?
2. Assuming you had the choice, on what side would you do your circuit in a strong cross-wind and why?
3. Shortly after takeoff, the towplane rocks his wings.. what do you do?
4. What is "sling-shooting off tow" and why is it so dangerous?
5. what is "thermalling etiquette"?
6. You decide to abandon the launch because you have not turned the barograph on... what is your first action?
7. Who is responsible for checking the tail dolly has been removed prior to launching?
8. what are the common causes of checks being missed prior to take-off?
9. How long should you wait before flying after donating blood?
10. Above what altitude must oxygen be carried and used?
11. what documents must be carried in the glider?
12. who has right of way, a glider on finals or a glider about to launch?
13. who do you report a gliding accident to?
14. who can give permission to shift I recover a damaged glider?
15. what is the "break-off point"?
16. what cautions are necessary when thermalling downwind of the airfield?
17. How much height do you think will be lost if you stall and do one turn of a spin in your glider?
18. what height above ground must all intentional stalling be completed by?
19. what is required before conducting solo aerobatics?
20. what are your actions if you find the brakes jam open when in the circuit?
21. How close can you fly to the ground when ridge soaring?
22. Outside controlled airspace, at 2000 ft, how close to cloud can you legally fly?
23. If you see a potentially dangerous practice while gliding, what should you do about it?
24. what are the dangers of tail sliding in a glider and when can it occur?
25. what are your actions if the canopy comes open during your launch?
26. who has responsibility for deciding whether to launch; the glider pilot or the tow pilot?
27. where do you find out how to rig and de-rig your glider?
28. What cautions do you take if flying in rain?
29. what action do you take if you consider you are high in the circuit?
30. By what distances should you clear obstructions and other aircraft when landing?

11. B Certificate Airmanship Questions

1. Why is it necessary to report any landing suspected of being heavier than normal?
2. where should you look to find the glider's minimum and maximum weak link strengths?
3. why is loose tape on a control surface a danger?
4. what effect does a deflated tyre have on the glider's performance?
5. why is a weak link fitted to a cable?
6. What is used as the weak link for an aero tow?
7. what happens if the static vents are blocked?
8. What is the purpose of the duplicate check after rigging?
9. How do you check that the controls of a glider are correctly connected?
10. When checking a back release, at approximately what downward angle should the rope or cable automatically release?
11. why is it important not to pull gliders forwards or backwards by the wing tips?
12. what are the errors of the ASI?
13. What is the danger of loose articles in the storage locker of a glider?
14. what is FOD and why is it dangerous?
15. How do you check rudder cables for serviceability?
16. Why does the glider have a maximum rough air speed?
17. what is the minimum recommended length for an aerotow tow rope?
18. what causes gelcoat cracking on fibreglass gliders?
19. Is it okay to land with the gear up to shorten the landing roll in a short paddock?
20. Where is it safe to push and lift a glider when manoeuvring it on the ground?
21. why is tape sealing of the wing I fuselage joint important?
22. How does the canopy jettison system work in your glider?
23. what is "control bonding" and why is it done?
24. what do you need to check when looking at a glider's Technical Log?
25. Does the compass need to be serviceable for flight?
26. what action do you take if you find a small hole in the fabric I a star craze impact mark in the gelcoat I dent or tear in the metal skin cladding (as appropriate to the type of construction) behind the main wheel?
27. what might cause one wing to stall before another?
28. Is it acceptable to do an aerotow launch using a towrope that has a knot in it?
29. what is a Deviation Card and how do you use it?
30. what loads act on the main spar rigging pins in flight?

12. Model Answers to the B Certificate Theory Questions

1. It increases as the vertical component of the lift vector that balances the weight is reduced as the glider is banked.
2. It is the ratio between the glider's span and the mean chord of the wing expressed as either span divided by the mean chord or more accurately, span squared divided by the wing area.. High aspect ratio distinguishes glider wing design from that of power planes. It gives greater performance by having a smaller percentage of the wing affected by airflow leaking around the wing tip from the higher pressure below the wing to the reduced pressure above it.
3. Laminar flow is the smooth, streamlined flow of air over the glider's surface that gives low drag characteristics / values; as opposed to turbulent or separated flow that has high drag values.
4. Angle of attack... known as the critical angle.
5. Increases it as the lift generated by the wing is reduced due to the sideways component of the flow of the air making the wing less efficient on the "upwind" side and partially blanketed by the fuselage on the "downwind" side.
6. In a spiral dive, speed will be increasing, in a spin it remains low; the controls will feel heavier due to the increasing speed in the spiral, in the spin, they remain light; G will be increasing in the spiral, in the spin it will remain around 10.
7. This is the tendency of the wing to resist movement in roll, caused by the increased angle of attack generating more lift on the down going wing.
8. Rain drops disrupt laminar flow, reducing lift and increasing drag as well as increasing the gliders weight... albeit only fractionally. All this reduces the gliders performance and increases the stalling speed in all configurations. So, avoid getting wet where possible and if you get wet, fly a couple of knots faster to keep a safe margin above the stall and plan / allow for an increased rate of descent/reduced glide performance especially in the circuit.
9. Full control... but common sense says be kind to your glider and only use as much as you have to.
10. This is the speed at which the glider's rate of descent is least so at this speed it will stay up longest for any given height started from. Usually a couple of knots above the stall speed and below the best LID speed.
11. The gliders weight divided by the wing area. Low wing loading gives a low speed handling advantage and good climb performance in weak conditions while high wing loading gives good high speed performance as this increases the speed for the best gliding angle. Wing loading is varied by carriage of ballast or a flap system that changes wing area or effective lift coefficients.
12. True Air Speed is the actual speed at which the glider is travelling through the air and this increases compared to IAS as altitude increases This is due to the reduction in temperature, pressure and density progressively reducing the pitot pressure that the ASI is sensing despite it going through the air at the same speed.
13. It has positive stability evidenced by it tending to return to its original heading

14. It responds directly to the flow of air over the canopy and this is indicative of the airflow over the wing which ideally is from leading edge directly aft and not at some angle which would indicate a slip or skid through the air.. both of which reduce the gliders LID or efficiency. If the string is deflected, it can be used as a pointer to the rudder that needs to be applied.
15. The increase is a function of the increased load factor, or "G" which for this AoB is 2G. The relationship or function is the square root so this would be 1.414.. which gives an increase of around 40 %. For a basic stall speed of 38 kts, it increases to 54 kts.
16. The stall speed is increased so the nose attitude will be lower for the same speed if clean, the sound will be greater due to the slightly higher speed and the controls will still be effective due to the higher speed. There may well be buffet from the turbulent flow behind the brakes which could be mistakenly dismissed as being the cause of what is actually pre stall buffet as the stall is approached.
17. Set it for the speed expected during the launch once airborne. Thereafter, trimming is a continual task to be accomplished after the desired speed is to be altered.
18. Localised gusts from turbulent air, thermals and ridge lift can increase the angle of attack of part or all of the wing, exceeding the critical angle of attack and causing it to stall.
19. Speed limiting brakes will not allow a glider to exceed its maximum permitted speed (V_{max}). Most modern gliders are only certified as capable of achieving this in up to 45 degree dives. It is wise to consult the Flight Manual for detail for your glider type.
20. Everything that is protruding into the airflow or that creates a disturbance to the laminar flow! Eg. wheels, aerals, gaps and joints, air intakes.
21. When one wing stalls before the other, it drops... or rolls which further increases the angle of attack putting it deeper into the stall and reducing the amount of lift being produced, while the opposite is happening on the other wing... its angle of attack is reduced so it is still producing lift and aiding the roll ... hence the auto rotation... it is self sustaining.
22. True as the longer it is spinning, the more fully established or stable it has become. It is important that the full and correct recovery action is taken and that the glider is being flown within its correct Cof G range.. otherwise it may not be recoverable.
23. Yaw is the driving force in a spin so the application of rudder is to reduce the yaw asap. Applying it first also ensures it is not blanketed by any movement of the elevator which with some tail configurations can reduce the rudder's effectiveness.
24. Any manoeuvre that involves pushing the control column forward from where it is for the speed I attitude you have. It commonly occurs during stall recovery and cable breaks during wire launching.
25. It will mean the glider is nose heavy so you will run out of aft elevator authority which will lead to a heavy landing. It will also mean you can not fly at the slower speeds needed to climb the glider in weak lift and your LID will be reduced due to

26. Wind gradient is the gradual change of wind speed with height, caused by surface friction. Wind shear is the rapid change of strength and I or direction with height. Combinations of the two are common in windy conditions in NZ.
27. The size of it's rudder compared to the area of the fuselage and fin.
28. This is the desired approach off which good landings are made! It is where the glider is heading in the right direction to get to the aim point, is maintaining the desired speed and rate of descent.
29. The wing is spanning a probable gradient so the upper wing will be in faster air than the lower wing. If turning into wind, this will cause the glider to over bank and vice versa turning downwind. The effect may be beyond the pilot's ability to prevent it from occurring.
30. No... and this is the danger with going too fast and pulling too hard. ,being a "poll bender" as you do not feel the extra load on you... but the wings sure do!

13. Model Answers to the B Certificate Airmanship Questions

1. The power aircraft landing.. as has any aircraft landing.
2. Circuit on the down wind side as this makes your base and final turn more into wind; you have a slower groundspeed on base and are less likely to overshoot on the base and final turn, thereby avoiding an undesirably steep turn onto finals.
3. Release.
4. Sling shooting describes the manoeuvre where the glider arcs the towplane much like a water skier a boat, to accelerate and gain height at the release point. It is highly dangerous as it can cause a towplane upset.
5. Rules of the air, courtesy and common sense advice on how to fly with others when thermalling. It includes things like keep a good look out, circle in the same direction, avoid flying in another glider's blind spot, try to have the same centre of turn, overtake safely, avoid abrupt changes in pitch and direction, don't be aggressive.
6. Pull the release before doing anything else!
7. The pilot in command. Best checked when walking out to the glider. It should also be one of the wing runners checks as a safe guard prior to giving the take up slack signal.
8. Distraction and interruption. If you suspect this, do the checks again... and always say them out loud so everyone knows you are doing them and not to interrupt or distract you.
9. 24 Hours is the recommended recovery time.
10. Oxygen must be available for use when operating above 10,000 ft. above mean sea level. You can fly up to 13,000 ft amsl. for 30 minutes with it available but must use it if there more than 30 minutes and at all time you are above 13,000 ft.
11. The DI book with the valid Tech Log, the Airworthiness Certificate and the Flight Manual if all the placards necessary for safe operation are not visible to you in the cockpit.
12. The glider on finals; landing aircraft have right of way over aircraft taking off However, if the launch can be accomplished without hindering the approach of the glider then it is safe for it to proceed and in many instances may well free up more options for the landing glider. This is a matter of judgment for the wing runner.
13. CAA must be notified via phone, fax or telex thru ATC. The Police need to be advised of any injury or property damage. The club CFI and President need to know for insurance purposes and any further action required by club rules.
14. CAA
15. This is the point at which upper air exercises are terminated and full commitment is made to joining the circuit for the approach and landing.
16. Be careful not to drift too far downwind and preclude your ability to do a frill circuit to your intended landing place.

17. Most gliders will lose between 300 and 500 ft in a one turn spin. this is often masked when practised at altitude because of a lack of close reference and the lag in the altimeter not accurately showing how low you go in the recovery prior to converting speed back to height... a luxury not available if you spin off your turn on to finals!
18. 1000 ft. Note that spinning is currently defined by CAA as an aerobatic manoeuvre so is restricted to above 1500 ft.
19. Training and issue of an aerobatic rating with an endorsement for each type of manoeuvre. Eg. stall turn, loop, chandelle.
20. Modify' your circuit by turning in early to ensure the steeper approach will still reach a safe point on the landing area and maintain a higher approach speed to ensure you have energy to flare the glider prior to touch down.
21. Legally, below 500 ft so long as it does not hazard persons or property on the ground. Common sense says you must have sufficient height to manoeuvre clear of terrain and a safety margin for any unexpected gusts and down draughts that may cause a sudden loss of height.
22. VFR rules are that we remain clear of cloud and in sight of ground or water and have an inflight visibility of 5 km.
23. Advise those concerned or if you feel this is not going to be effective, the CFI or another similarly responsible club official. To do or say nothing merely condones it.
24. A tail slide is when the glider flies backwards through the air. This can happen if the glider is zoomed up to near the vertical and held there till it stalls and drops. The airflow from behind now strikes the wing and control surfaces from their trailing edges and this causes them to rapidly deflect to their stops unless tightly restrained by the pilot. Damage to controls is common when this manoeuvre is done unintentionally.
25. Keep flying the glider... it will fly with the canopy open... even if it is a bit breezy! If just airborne, release and land ahead. If later in the launch, continue to a safe height then release. Whatever you do, don't let go of the stick when on tow. Once off tow, try and close the canopy. A bit of rudder to skid towards the canopy may help the airflow assist with closing it. If you can't close it, allow for the increased drag and subsequent increase in stall speed when planning your circuit and landing. Be mindful of possible damage to the tail area if the canopy comes off and strikes this area. Consider jettisoning the canopy if you think this will reduce any danger posed by having it open and flailing around. The best advice is to ensure it is closed and locked prior to take off
26. The tow pilot is responsible for the combination of glider and tug. If they say it is not suitable to launch, respect their judgment and stay on the ground.
27. In the glider's Flight Manual.

- 28 Rain drops disrupt laminar flow, reducing lift and increasing drag as well as increasing the gliders weight... albeit only fractionally. All this reduces the glider's performance and increases the stalling speed in all configurations. Water may also get into the pitot I static system so be alert for instrument failures. So, avoid getting wet where possible and if you get wet, fly a couple of knots faster to keep a safe margin above the stall and plan / allow for an increased rate of descent/reduced glide performance especially in the circuit.
- 29 Adjust the circuit pattern by turning wider downwind, use brake to descend back on to profile; delay turn on to base leg but caution overdoing this; fly a longer base leg; overfly the final turn position and then turn back to the final point; use S turns both down wind and on base leg; shift your aim point up the field... or any combination of these. The earlier you fix the problem the better.
- 30 Common sense says at least 50 ft over the top of a parked glider or obstruction and a wing span to the side if passing them on the ground.

14. Model Answers to the B Certificate Airworthiness Questions

1. You may have damaged the structure without realising it. An engineer is trained to look for signs of damage that may be progressive in nature, ie. set to fail at a later stage if not rectified.
2. In the glider's Flight Manual; they should be placarded in the cockpit and are sometimes also placarded by the release hook.
3. Loose tape will disturb the airflow behind it and make the control surface less effective. In extreme cases, it has caused control blanketing with associated handling problems. It can also work into a position where it can restrict or jam a control. It may also set up an unnerving vibration through the controls and high pitched whistling sound.
4. None once airborne... but it will slow take off acceleration and delay lift off, thereby requiring a longer take off distance to be available. On landing, it will slow the glider quicker but reduce the vertical energy absorption that an inflated wheel provides. When braking, it is more prone to tube rotation and subsequent tyre assembly damage.
5. The weak link is designed to protect the glider's structure from excessive loads during a launch.
6. The tow rope itself; the approved rope from the GNZ is manufactured to a standard that will not allow excessive loads to be placed on the release mechanism before it breaks.
7. The instruments that derive a static pressure reading will be in error; the ASI, Altimeter and the Varios.
8. To ensure that the glider is correctly rigged and that all controls are connected and functioning correctly.
9. Have someone hold the control surface gently and then apply a control movement in both directions to the full travel of the control, ensuring the response at the control surface is appropriate to the stick input.
10. It should release when it is at right angles to the fuselage. It should not have to be pulled aft and if it needs to be beyond this or is excessively tight, there may be something wrong with the release mechanism.
11. Pulling from the tips places too much strain on the wing root fittings because of the long leverage.
12. The errors of the ASI are minimal and generally insignificant in normal flight. It does suffer position error which means any slip or skid can cause erroneous readings. There is a small degree of lag due to instrument error (friction within the mechanism) but the apparent lag in the reading is due mainly to the inertia of the glider and the fact that it takes time to accelerate when the attitude is changed. At altitude, the instrument fails to compensate for changes in temperature, pressure and air density so under reads the true air speed of the glider through the air.

13. Any loose articles in a glider are a hazard, particularly in turbulence or in sudden decelerations. In both cases, even small objects may be accelerated and strike the gliders structure or the pilot with hazardous consequences. Pilots have been killed by batteries coming loose and striking them in the head during accidents.
14. Foreign Object Damage; a term that describes damage from any undesirable loose article in an aircraft that subsequently causes damage either directly or indirectly. An example of the latter is something like a coin or a small tool that is left in a glider, that works its way into the control mechanism and jams the flight controls, leading to a crash. We all need to do our bit in ensuring FOD is not left in the gliders we fix or fly.
15. Slowly run your fingers along a cable; if there is any fraying, you will be pricked in the finger! Ouch!! Be sure to check around the likely fray zones; where cables run through holes or around pulleys.
16. To protect the gliders structure from over stressing. At max rough air speed (VR) you can use up to full control deflection. Beyond this, a full control deflection will overstress the supporting structure. Up to V_a a strong gust will stall the glider before it over stresses it; beyond it, you risk structural overload and failure.
17. Fifty meters is the recommended minimum. This is a length that reduces the chance of tow upsets while maintaining ease of handling on tow. By starting with a longer rope, you can cut it and still be over the 50 m. in the event of a knot being impossible to undo. In specific situations when retrieving gliders, it is an acceptable practice to deliberately knot the rope to reduce its length, thereby increasing the take off run available to the tow plane.
18. The gelcoat is a protective layer of coloured polyester resin on the surface of the fibreglass cloth and epoxy resin Polyester is more brittle and has a different coefficient of expansion to the material below so suffers different stresses to the main structure. The small cracks appear around localised stress points during routine flight loads but are accelerated by extremes of temperature and in-flight loads and combinations of the two.
19. No; the manufacturer intends the glider to be landed gear down and the safety of the cockpit structure and its role in protecting the pilot from injury during even normal landing loads is lost with the gear up. With the gear down and the wheel brake operational, there should be ample braking available.
20. Check the Flight Manual but in general, push on the nose and the leading edge of the wing near the wing root using the flat of the open hand rather than the finger tips. Avoid pushing / pulling at the wing and tail tips and on any fabric only surfaces.
21. Sealing of joints prevents air spilling from the fuselage out over the wing and from below the wing to the top of the wing... all of which increases drag.
22. Check your Flight Manual and know how many handles / levers need to be operated, their location and the sequence of operation. Can you do it with your eyes closed?

23. A small strip of braided cable is attached between all control surfaces to allow complete electrical bonding of metal components. This helps prevent electrical potential differences within the aircraft and damage in the event of a lightning strike.
24. There must be a DI Book I Tech Log, an Airworthiness Certificate, a CAA Form 2129 Radio Station Approval, and the CAA Form 2173 Weight and Balance Data. Check that all documents are for the glider they are in, that the Tech Log is current and that any special conditions or requirements and maintenance are within the due date or hours as specified. ie ensure that the hours flown do not exceed the next check interval.
25. Yes. It is legally required even for VFR flight.
26. Contact an engineer and have it checked. It may be repaired with a temporary patch but this needs to be authorised by an engineer.
27. Anything that causes the wing to reach its critical angle of attack before the other. This can include damage to the surface, a dirty surface, a wing at a different angle of incidence to the other or a heavier wing than the other requiring some aileron input to achieve a wings level stall. Of course, in a turn, the inner wing will stall first due to it flying slower than the outer wing.
28. Normally NO, as the rope is weakened by any knot,. However, in specific situations when retrieving gliders from paddocks, it is an acceptable practice to deliberately knot the rope to reduce its length, thereby increasing the take off run available to the tow plane.
29. Deviation is a measure of the error in the compass between the real magnetic heading of the glider and compass heading during flight with all normal instruments and radio equipment turned on. Cardinal headings are recorded on a card with the compass heading to fly to achieve them. The card is required to be fitted in the cockpit within view of the pilot.
30. Shear loads.