

**GLIDING NEW ZEALAND  
QUALIFIED GLIDER PILOT CERTIFICATE  
PERFORMANCE & TECHNICAL KNOWLEDGE EXAMINATION**

Time Allowed: 1 Hour

**INSTRUCTIONS:**

1. Do not write on this examination paper.  
Write only on the answer sheet provided.
2. On the answer sheet, enter your name, date, club and paper number.

**This is a SAMPLE Performance & Technical Knowledge Exam.**

3. Questions are of the multiple choice answer type and are to be answered by placing a cross on the answer sheet and over the appropriate letter (A, B C or D) at the number corresponding to the question.

eg. 7. A. B. C. D.

4. If you make an error and wish to change your choice of answer, circle the error and place a cross on the new answer chosen.

eg. 7. A. B. C. D.

5. The paper consists of twenty questions. Read all the questions carefully before making your choice of the most correct answer. To attain a pass you must answer correctly at least fourteen questions.
6. You must return both the examination paper and the answer sheet to the supervisor at the completion of the exam.
7. If you consider any aspect of this examination requires amendment or can be improved upon, please do not hesitate to advise the National Operations Officer.

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**Tips On Exam Technique**

1. This is a multi choice exam where you have 4 possible answers. Only one will be completely correct. The other answers may range from being partly or nearly right to being obviously wrong!
2. Read all the answers before committing yourself to the answer you consider correct.
3. Work out how much time to allow for each question then keep track of time.
4. Don't get hung up on one particular question; move on and complete those you are confident you know the right answer then come back to those you left.

**PERFORMANCE & TECHNICAL KNOWLEDGE**

1. Which of the following affects the stalling speed of the glider?
  - (a) Angle of bank, load factor, surface condition of the wing and all up weight.
  - (b) Load factor, altitude, all up weight and surface condition of the wing.
  - (c) Angle of bank, all up weight, brake position and wind direction.
  - (d) Load factor, trim position, water on the wing and ambient temperature.
  
2. The adverse yaw that occurs when you roll into a turn is caused by:
  - (a) Aileron Drag creating yaw in the same direction as the rolling input.
  - (b) Aileron Yaw creating drag against the direction of roll.
  - (c) Aileron Drag creating yaw against the direction of roll.
  - (d) Using rudder before applying the aileron as you enter a turn.
  
3. The lift acting through the centre of pressure of a wing moves :
  - (a) Forward as the angle of attack is reduced.
  - (b) Aft as the angle of attack approaches the critical angle of attack.
  - (c) Aft as the stagnation point moves aft.
  - (d) Forward with an increase in the angle of attack until the stall is reached.
  
4. In a balanced turn at 60 degrees Angle of Bank the load factor is 2G. This will cause a Basic Stall Speed of 32 kts to increase to:
  - (a) 64 knots.
  - (b) 60 knots.
  - (c) 45 knots.
  - (d) 42 knots.

5. “Washout” is a term that describes:
- (a) The cleaning out of the water ballast tanks to prevent the accumulation of mould.
  - (b) The design twist in the wing which reduces the angle of incidence towards the wing tip.
  - (c) The tapering of the wing tips to washout tip stalling.
  - (d) The outward flow of high pressure air around the tip that creates tip vortices.
6. The largest in-flight loads on the fuselage probably occur during a pull-up from a dive at high speed. At this moment:
- (a) There is a very large down load on the tail as well as inertia loads from the mass of the tail and rear fuselage and both bend the rear fuselage down.
  - (b) There are inertia loads from the mass of the pilot and nose bending the forward fuselage down.
  - (c) The uploads on the tailplane are greatest when the pilot is pulling back on the stick.
  - (d) Both a and b.
7. Which of the following features contributes most to the torsional stiffness of a cantilever wing?
- (a) The wing skin.
  - (b) The wing ribs.
  - (c) The wing attachment fittings.
  - (d) The wing spar.
8. You discover a broken locking wire on a rudder pedal turnbuckle during a DI. You can:
- (a) Replace the wire with copper or stainless lockwire.
  - (b) Fly the glider so long as the rudder range of movement is satisfactory.
  - (c) Secure the turnbuckle using insulation tape.
  - (d) Have an engineer replace the locking wire before further flight.

9. Increasing the all up weight of a glider:
- (a) Reduces the best glide angle.
  - (b) Increases the best gliding angle.
  - (c) Requires an increase of the speed at which max L/D is achieved.
  - (d) Increases both Min Sink and max L/D.
10. Which part of the wing spar has the greatest compression load during turning flight?
- (a) The top surface.
  - (b) The bottom surface.
  - (c) The middle third of the spar length.
  - (d) The spar surface between the fuselage and the brake box.
11. In a steady turn to the right, some left aileron is required:
- (a) To counter the roll from adverse yaw.
  - (b) To counter the aileron drag induced roll.
  - (c) To counter the roll induced by washout at the faster moving right wing.
  - (d) To counter the roll produced by the faster flying left wing.
12. A glider flown with more than the maximum cockpit loading:
- (a) Will spin more readily.
  - (b) May not have sufficient elevator authority to roundout for a normal landing.
  - (c) Will stall at a higher than normal angle of attack.
  - (d) Will feel heavier on the elevator but will glide better at slower speeds.

13. A glider flying at 40 knots has a profile drag of 14 kg. At 80 knots, the profile drag will be:
- (a) 14 kg.
  - (b) 28 kg
  - (c) 56 kg.
  - (d) 84 kg.
14. The angle at which the wings are attached to the fuselage is called the Angle of.....
- (a) Attack.
  - (b) Attachment.
  - (c) Incline.
  - (d) Incidence.
15. The following is true of induced drag:
- (a) It is greatest when the angle of attack of the wing is high.
  - (b) It is greatest at high speed.
  - (c) It is greater on high aspect ratio wings than on low aspect ratio wings.
  - (d) Both (a) and (c).
16. Mass balancing of ailerons is used to:
- (a) Reduce aileron drag during rolling manoeuvres.
  - (b) Reduce the likelihood of aileron flutter at high speed.
  - (c) To provide some feel to the controls which would otherwise be too light and easily overstressed.
  - (d) Reduce adverse yaw and lighten the aileron control loads at high speed.

17. Damage to the leading edge of a wing is critical as the D nose section:
- (a) Is where the laminar flow is least and drag greatest so performance loss is high.
  - (b) Provides the torsional stiffness to resist the twisting forces placed on the wing.
  - (c) Is strengthened to resist the compressive force of the airflow at high speed.
  - (d) Stops air getting inside the wing which could blow the skin off.
18. The force acting on the main spar rigging pins in flight is:
- (a) Tension.
  - (b) Compression.
  - (c) Shear.
  - (d) Torsion.
19. When refilling your Oxygen cylinder you must only use Aviation Oxygen because:
- (a) Other types like that used for welding can contain poisonous contaminants.
  - (b) It is 99.9% dry so there is no moisture to freeze in valves when it gets cold.
  - (c) It contains an additive to prevent hypoxia.
  - (d) Both (a) and (b).
20. Increasing weight.....the glider's indicated stall speed and increasing altitude..... the glider's indicated stall speed.
- (a) Increases / Does not change.
  - (b) Increases / Increases.
  - (c) Increases / Decreases.
  - (d) Decreases / Decreases.

***Answers to Technology and Performance questions:***

<b>Question</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>	<b>15</b>	<b>16</b>	<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>
<b>Answer</b>	A	C	D	C	B	D	A	D	C	A	D	B	C	D	A	B	B	C	D	A