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PRE-SOLO WRITTEN TEST

Client Name _____ Date _____ Completion Success _____

GENERAL & LIMITATIONS

1. Engine
 - a. What engine powers the TB10?
 - b. What is the rated horsepower?
 - c. How many cylinders are installed and how are they opposed?
 - d. How is the engine aspirated?
 - e. How is the engine cooled?
 - Internally?
 - Externally?
2. Oil
 - a. What grade of oil should be used for the TB10?
 - b. What is the minimum operational oil level?
3. What is the minimum static RPM of the TB10 engine?
4. Fuel
 - a. What is the total usable fuel quantity?
 - b. What is the total usable fuel quantity per wing?
 - c. How much fuel is unusable per wing?
 - d. What is the total fuel quantity

5. What fuel grade must be used, and what color should it be?
6. What is the max take off weight?
7. What is the maximum landing weight?
8. What category airplane is the Tobago, and are spins prohibited in this model?
9. Explain the significance of:
 - a. The bottom of the green arc
 - b. The bottom of the white arc
 - c. The top of the white arc
 - d. The top of the green arc, bottom of the yellow arc
 - e. Top of the yellow arc at the red line

10. Speeds

VS0 _____ VS _____ Best Glide _____ VA _____ VFE _____
 VY _____ VX _____ VNO _____ VNE _____
 Threshold crossing speed _____

What is the maximum demonstrated crosswind component?

NORMAL & EMERGENCY PROCEDURES

1. What is the max allowable magneto drop during run up.
2. What steps would you follow to deal with a voltmeter entering the red zone, and generator warning light illumination in flight? What could trigger this problem?
3. Describe the go around procedure?

4. Describe the pilot actions following power loss in flight?
5. Describe the pilot action to be taken if oil temperature is rising while oil pressure is falling? What is probably happening?
6. Describe the short field take off procedure?
7. How can a pilot suffer from Carbon Monoxide poisoning in flight. What symptoms will a poisoned pilot begin to have? What action should be taken.
8. Describe how a pilot confirms if they have an adequate fuel supply? How much can a pilot rely on the fuel gauges? When are these gauges legally required to be fully accurate?
9. What is the minimum fuel reserve for Day VFR? For Night VFR? For Day or Night operation of a 1World Aero rental?

PERFORMANCE

1. What is stall speed in a 45 degree bank with flaps up?
2. What are the short field take off and landing distances from a 500 ft pressure altitude at 30 degrees Celsius?
3. At a pressure altitude of 6000, at standard temperature at 70% power:

- a. State the fuel flow.
 - b. State the TAS.
 - c. State the power setting.
4. What happens to performance as density altitude increases? What hazards can this increase create?
 5. What is density altitude?
 6. How many G's are incurred at 60 degrees of bank, and what happens to load factor as the bank angle increases beyond 60?
 7. Describe procedures for departing behind a large aircraft that has just:
 - a. Departed
 - b. Landed

DESCRIPTION

1. What is the purpose of the alternator? What is its relationship to the battery?
2. What is the function of the over voltage regulator or alternator control unit?
3. In what phases of flight should you refrain from switching fuel tanks?
4. At what interval should you change fuel tanks?
5. Magnetos:
 - a. What is a magneto?
 - b. How many magnetos are on the engine?

- c. How many spark plugs are on the engine?
 - d. If you loose one magneto how many plugs will become inoperative and which ones?
6. Describe the effect of the following controls upon engine roughness.
- a. Mixture
 - b. Carb heat
 - c. Fuel pump
 - d. Throttle
 - e. Fuel Selector
 - f. Magnetos
7. Is there any relation between the electrical system and engine roughness?
8. When are you most likely to get carburetor icing? What are the symptoms?
9. Why does carburetor icing occur?
10. How does the carburetor heater work?
11. What pilot action can be taken to remedy rough magneto drops during run-up.
12. What action should be taken if the roughness can not be eliminated through the above-mentioned procedure?

13. How can use of the cabin heater lead to carbon monoxide poisoning

14. Fuel Drains
 - a. Where are the fuel drains located?
 - b. How many are there?
 - c. When must they be drained?
 - d. What constitutes a failed test sample of fuel and what preflight action does this entail?

15. What is the maximum allowable fuel imbalance for a TB10?

16. How do you get rid of carburetor icing?

17. What indications will the use of alternate static provide?

18. What benefits does leaning the mixture provide for
 - a. Power output
 - b. Preventing spark plug fouling
 - c. Preventing valve clogging

19. Define detonation and pre-ignition and explain what causes these problems.

20. What hazards are associated with hand propping to start an engine. What dangers are associated with pulling a propeller to limber oil during winter.

AERODYNAMICS

1. Explain the venturi effect or Bernoulli principle, and how does it apply to a wing?
2. Define Angle of Attack
3. Define Critical Angle of Attack.
4. Does critical angle of attack ever change?
5. Does stall speed change?
6. Does wing loading directly affect stall speed?
7. Define parasite drag, induced drag, and explain their relation to changes in airspeed and AOA.
8. Do bank changes, weight changes, and coordination all affect wing loading?
9. What happens to maneuvering speed as weight increases? Is this an advantage and why?
10. What is the purpose of flaps?
11. What happens to load factor as bank increases.
12. What happens to stall speed as load factor increases.
13. Describe the spin recovery procedure.

14. What causes an airplane to enter a spin?
15. Describe what the region of reverse command is.
16. Define Ground Effect, and explain why it is significant.
17. How does frost affect lift and drag on an airplane and what hazards does it create?
18. Under what three conditions must a pilot counteract left turning forces? How? What are the four causes for these three conditions? Explain why they occur.
19. How many Gs are imposed at 60 degrees of bank. What happens to loadfactor as bank angle increases beyond 60 degrees.

FEDERAL AVIATION REGULATIONS

1. What is the lowest altitude that an airplane can operate over a congested area? Uncongested area?
2. Describe right of way:
 - a. Airplane vs glider or airship
 - b. Airplane vs airplane on the right
 - c. Airplane vs airplane head on
 - d. Airplane vs airplane lower in the pattern
3. Describe the new ADIZ procedures for a flight from KFME to KFDK and back.

4. What is the minimum visibility and cloud separation requirement that a student pilot may utilize in any airspace?
5. What student pilot limitations go away when obtaining a private pilot certificate?
6. What is the VFR minimum visibility and cloud separation requirement that is common to class E below 10,000 feet, D, C, day and night and Class G at night?
7. What are notams and how do they affect pilots?
8. What pilot documents must be on your person when in flight?
9. What inspections must be found to be in compliance during preflight?
10. List the required VFR day equipment as set forth by the FAA that applies to the TB10.
11. What does an item listed with an R next to it imply? (Look in the wt and balance equipment list of the TB10 POH)
12. Describe daytime intercept procedures. What frequency should you monitor to reduce the chance of being intercepted and why?

13. Describe how a pilot tracks a VOR radial with normal sensing, and how to avoid reverse sensing.

CHARTS

1. Where is the nearest Class B airspace to N771TR's base airport, and how do you avoid it laterally and vertically?
2. Where is the nearest TFR, restricted area, prohibited area, or FRZ and how do you stay out of it?
3. Is mode C required to be operational for a flight to or from KGAI or KFME?
4. What frequency is

KGAI based pilots	KFME based pilots
121.6	121.725
128.7	119.7
128.275	123.9
123.075	123.05
5. What airplane documents must be onboard for any flight?
6. From looking at a VFR aeronautical chart, how do you know if any of the runways at an airport are right traffic?

WEATHER

1. Does AWOS report ceilings in AGL or MSL?
2. What does a close temperature dew point spread imply?

3. What is the difference between relative humidity and dew point?
4. What type of weather is associated with fast moving cold fronts?
5. What winter icing hazard is associated with arriving warm fronts?
6. At what time of day is fog most likely?
7. What affect does frost have on an airplane that is departing?
9. What ingredients are needed for a thunderstorm to develop?
10. What is a microburst, and what is its relationship to thunderstorms?
11. What hazards are created by a thunderstorm and how far should an airplane be piloted away from a severe cell?
12. What are airmets?
13. What is airmet:
 - a. Tango
 - b. Sierra
 - c. Zulu
14. What is a sigmet?
15. What is a convective sigmet?

AEROMEDICAL

1. Define Hypoxia. Explain how a pilot can develop hypoxia, and what the effect is.
2. Define hyperventilation. Explain how it can develop, how it affects the pilot, and how a pilot can combat hyperventilation.
3. What is the danger of scuba diving and flying soon after?