

**Scott AFB Aero Club/Flight Training Center**  
**Symphony SA160 Written Exam**  
**1 June 2010**

**Multiple Choice. Select the letter of the answer that best answers the questions.**

1. When maneuvering on the Aero Club ramp another aircraft is taxiing and you need to do a minimum radius turn, what is the minimum radius?
  - a. 20.5 feet
  - b. 21.7 feet
  - c. 22.8 feet
  - d. 35 feet
  
2. The SA160 is equipped with a direct drive, air-cooled, horizontally opposed, four cylinder engine. The maximum rated horsepower is:
  - a. 150 BHP at 2700 RPM
  - b. 160 BHP at 2700 RPM
  - c. 170 BHP at 2700 RPM
  - d. 180 BHP at 2700 RPM
  
3. The total useable fuel in the Symphony 160 is listed at \_\_\_ gallons.
  - a. 14.5 gallons
  - b. 20.3 gallons
  - c. 29.1 gallons
  - d. 32.2 gallons
  
4. The maximum oil capacity of the engine on the Lycoming O-320 is \_\_\_\_\_ quarts with the minimum quantity listed by the POH of \_\_\_\_\_.
  - a. 7 and 4 quarts
  - b. 7 and 5 quarts
  - c. 8 and 4 quarts
  - d. 8 and 5 quarts
  
5. The SA160 is certified in the Normal category. The maximum certificated weights are:
  - a. Takeoff 2150 lbs, Landing 1950 lbs
  - b. Takeoff 2150 lbs, Landing 2042 lbs
  - c. Takeoff 2150 lbs, Landing 2150 lbs
  - d. Takeoff 2200 lbs, Landing 2200 lbs
  
6. There are two areas of baggage compartment. What is the maximum weight between the two that a pilot may load in the aircraft?
  - a. 99 lbs
  - b. 115 lbs
  - c. 145 lbs
  - d. 165 lbs
  
7. The normal operating range of the engine, green arc, is what RPM range?
  - a. 500 – 2700
  - b. 600 – 2700
  - c. 1000 – 2700
  - d. 1200 – 2700

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8. As a normal category aircraft, which of the following maneuvers may be accomplished exceeding 60 degrees of bank?
  - a. Steep Turns
  - b. Accelerated Stalls
  - c. All of the Above
  - d. None of the Above
  
9. The SA160 is certified to handle what load factors during operations with flaps up?
  - a. Positive 2.0
  - b. Positive 3.8
  - c. Negative 1.5
  - d. Only B and C
  
10. The SA160 is equipped with four vortex generators. During the preflight you notice that one appears to be in poor condition. What is the action that you should take?
  - a. Continue flight, there are still three remaining
  - b. Continue flight and write a maintenance discrepancy after the flight
  - c. Stop the flight until maintenance has had a chance to look at the vortex generator in question
  - d. There are no vortex generators on the aircraft
  
11. If the pilot sees a “Flap in Motion” light stay on when the flaps are either fully extended or fully retracted the pilot should pull the FLAPS circuit breaker and land as soon as practical.
  - a. True
  - b. False
  
12. The maximum demonstrated crosswind component of the Symphony 160 is
  - a. 17 knots landing
  - b. 20 knots takeoff
  - c. Both a and c are correct
  - d. Both a and c are incorrect
  
13. During which phases of flight should the electric fuel pump be in operation?
  - a. Takeoff
  - b. Landing
  - c. When engine driven fuel pump fails
  - d. All of the above
  
14. Which combination of procedures is proper for the takeoff and climb?
  - a. Normal takeoff: Flaps 20 degrees; rotate at 53 KIAS, climb at 65-75 KIAS.
  - b. Short field with obstacle: Flaps at 20 degrees; rotate at 53 KIAS, maintain 62 KIAS until clear of obstacle, above 50 feet, retract flaps slowly and accelerate to 80 KIAS.
  - c. All the above are correct procedures.
  - d. None the above are correct procedures.

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15. The pitot heat on normal aircraft is operated during flight into IMC. On the Symphony when is the pitot heat operated?
- During flight into IMC
  - When visible moisture exists
  - During all phases of flight
  - For test purposes only
16. Which is the proper procedure for a short field landing in the SA160?
- Flaps 40 degrees, Airspeed 65 KIAS, Nose wheel lower gently.
  - Flaps 40 degrees, Airspeed 75 KIAS, Nose wheel firm on runway.
  - Flaps up, Airspeed 65 KIAS, Nose wheel lower gently.
  - Flaps up, Airspeed 75 KIAS, Nose wheel firm on the runway.
17. The SA160 flap position use during takeoff unless a strong crosswind exists is:
- Flaps up
  - Flaps 10 degrees
  - Flaps 20 degrees
  - Flaps 40 degrees
18. When flying the Symphony the proper procedure to lean the mixture based of EGT once cruise power is established is?
- Press BUTTON 1 on VM 1000 display, smoothly lean the mixture raising one EGT bar per two seconds, when EGT starts to flash enrichen the mixture as appropriate.
  - Press BUTTON 2, smoothly lean the mixture, when CHT starts flashing enrichen the mixture as appropriate.
  - Press BUTTON 2 to select CHT mode, then press BUTTON 1 on the VM 1000 display, smoothly lean the mixture raising on EGT bar per two seconds, when EGT starts to flash enrichen the mixture as appropriate.
  - None of the above are correct.
19. On the Symphony aircraft there is a feeder tank that takes the fuel from the wing tanks and stores fuel for a high pitch descents. After a 10 minute descent with less than 2.5 gallons per side, flaps extended, and the aircraft requires how long in level flight and flaps retracted?
- 30 seconds
  - 60 seconds
  - 2 minutes
  - 3 minutes

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20. What is the approximate ground roll takeoff performance in feet for the SA160 under the following conditions?

OAT	18 Degrees Celsius
Pressure Altitude	1000 Feet
Wind	4 knot tailwind
Runway	Dry, Concrete surface
Weight	2150 lbs
Speed	62 KIAS
Other	50 Foot obstacle

- a. 1395 feet
- b. 1515 feet
- c. 1624 feet
- d. 1750 feet

21. What is the best range of the Symphony 160 under the following conditions?

Power	70% BHP
Altitude	6000 feet
Wind	Zero

- a. 260 nautical miles
- b. 300 nautical miles
- c. 325 nautical miles
- d. 375 nautical miles

22. What is the landing ground roll of the SA160 under the following conditions?

OAT	19 Degrees Celsius
Pressure Altitude	500 Feet
Wind	5 knot headwind
Runway	Dry, Concrete surface
Weight	2150 lbs
Speed	74 KIAS
Other	Flaps up

- a. 1061 feet
- b. 1156 feet
- c. 1288 feet
- d. 1359 feet

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23. Given the following conditions, is the aircraft within weight and balance limits?

<b>Item</b>	<b>Weight (lbs.)</b>	<b>Arm</b>	<b>Moments</b>
Basic Empty Weight	1508	98.6	148,688.8
Pilot	200	101.2	
Passenger	200	101.2	
Fuel	174	107.4	
Baggage #1	75	122.8	
Baggage #2	75	159.1	
Total			

- a. Yes, aircraft is within weight and balance limits.
- b. Yes, aircraft is within weight but not CG limits.
- c. No, aircraft is not within weight but within CG limits.
- d. No, aircraft is not within weight and balance limits.

24. The nose gear on the Symphony 160 is connected to the rudder cable.

- a. True
- b. False

25. The SA160 has an approved flaps range of:

- a. There are no flaps on the SA160.
- b. Flaps up to flaps 20 degrees
- c. Flaps up to flaps 30 degrees
- d. Flaps up to flaps 40 degrees

This is the end of the open book portion of the written test. The closed book questions are on the back of the answer sheet cover emergency procedures.

When you have completed the test, have your instructor grade the test, and review any questions that you answered incorrectly. Also be sure both you and your instructor sign your test answer sheet, place it in your folder, and update your file on the Flight Training Center program.

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**EMERGENCY QUESTIONS - CLOSED BOOK**

1. Engine Fire During Start

- a.
- b.
- c.
- d.
- e.

2. Engine Fire In Flight

- a.
- b.
- c.
- d.
- e.

3. Engine Failure In Flight (Cruise)

- a.
- b.
- c.
- d.
- e.

4. Emergency Approach and Landing

- a.
- b.
- c.
- d.
- e.

5.  $V_A$  \_\_\_\_\_ lbs

6.  $V_A$  \_\_\_\_\_ lbs

7.  $V_A$  \_\_\_\_\_ lbs

8.  $V_A$  \_\_\_\_\_ lbs

9.  $V_{FE}$  \_\_\_\_\_ (First Extension Increment)

10. Best Glide Speed @ Maximum Gross Weight \_\_\_\_\_