

DO NOT WRITE ON THIS TEST
KIRTLAND FLIGHT CENTER AIRCRAFT TEST (written exam)
for Cessna 172 Hawk XP

For the following questions, you will need to refer to the (1) Cessna Pilot Operating Handbook (POH), (2) the Kirtland Flight Center N736QC Checklist, (3) Garmin GFC500 Digital Autopilot manual, and (4) the Horizons Instruments P-1000 digital tachometer manual. The bonus questions at the end of the test are optional and can improve your score.

USE THE ATTACHED ANSWER SHEETS

1. The Hawk XP engine is a 6-cylinder Continental IO-360-K that is rated at 195 horsepower continuously. One of the cited fuel flow rates at full throttle (2,600 rpm) is _____
 - a. 18 gallons per hour at sea level
 - b. 16 gallons per hour at 4,000 ft MSL
 - c. 12 gallons per hour at 8,000 feet MSL
 - d. 13 gallons per hour at 12,000 feet MSL
2. The engine cowl flap should typically be open during ____
 - a. Enroute climb, bailed landing, and after landing.
 - b. Cruise.
 - c. Cruise and descent.
3. The engine oil capacity including the oil filter is _____
 - a. 8 quarts.
 - b. 9 quarts.
 - c. 10 quarts.
4. Do not operate the engine with less than _____
 - a. 6 quarts of oil.
 - b. 7 quarts of oil.
 - c. 8 quarts of oil.
 - d. 9 quarts of oil.
5. (True or False) – The oil pressure indicator should indicate positive oil pressure within 30 seconds after starting the engine in normal operating conditions.
6. The magneto check is accomplished at 1,800 RPM. What is the maximum drop per mag and the maximum difference between mags?
 - a. 150 RPM max drop; +/- 50 RPM difference between mags
 - b. 125 RPM max drop; +/- 50 RPM difference between mags
 - c. 150 RPM max drop; +/- 25 RPM difference between mags

7. (True or False) – During engine runup, the propeller should be cycled from high to low rpm, and returned to high rpm (full in).
8. (True or False) – During taxiing and ground operations, the desired idle speed of the engine should be maintained at 800 to 1,000 rpm.
9. Zero oil pressure and rising oil temperature indicate that engine failure is _____
- a. imminent and the pilot should prepare for a forced landing.
 - b. not suspected because failure of sensors or wiring is suspected.
 - c. likely within 10 minutes.
10. During cruise at 80% power, adjust the fuel mixture for altitude using _____
- a. the peak exhaust gas temperature (EGT) gauge reading
 - b. best power
 - c. 50 degrees F rich of peak EGT gauge reading
11. The fuel capacity for all flight conditions is _____
- a. 54 total and 48 usable.
 - b. 52 total and 49 usable.
 - c. 50 total and 44 usable.
12. The recommended fuel grade is 100 LL and the color is _____
- a. Green
 - b. Blue
 - c. Red
13. (True or False) – The maximum certificated weight in the POH for normal category is 2,550 lbs.
14. The maximum combined weight capacity for the two baggage areas is _____
- a. 200 pounds
 - b. 240 pounds
 - c. 237 pounds
15. Maximum Flap Extended Speed (V_{fe}) is _____
- a. 85 KIAS for all increments
 - b. 80 KIAS for 10-degree increment
 - c. 90 KIAS for all increments
16. The aircraft battery is rated at ____ and the alternator charges at _____
- a. 12 and 14 volts
 - b. 24 and 28 volts
 - c. 32 and 38 volts

17. If a circuit breaker pops open for an interior light, how many times can it be reset?
- Once
 - Twice
 - As many times as deemed necessary
18. (True or False) – Excessive high voltage (alternator over charging) is indicated by a red indicator light located above the master switch. The over-voltage sensor will automatically shut down the alternator. Assuming the over voltage is only momentary, the pilot should attempt to reactivate the alternator system by switching both sides of the master switch off and on.
19. (True or False) – If prolonged starter cranking is necessary, allow the starter to cool at frequent intervals because excessive heat may damage the starter armature.
20. When towing the aircraft, do not exceed the nose-gear turning angle of ____ degrees on either side of center:
- 10
 - 20
 - 30
 - 45
21. Tire pressures for the Hawk should be:
- Nose 35 psi, mains 30 psi
 - Nose 45 psi, mains 38 psi
 - Nose 40 psi, mains 38 psi
22. If the pitot static system is suspected of causing erroneous readings, the pilot should ____
- Declare an emergency
 - Pull the ALT (alternate) static source valve
 - All of the above
23. Assuming these conditions (two people on board, aircraft total weight of 2,150 pounds, propeller windmilling, and flaps up), the maximum glide distance obtained at an airspeed of 69 KIAS will be approximately ____
- 600 feet per minute.
 - 600 feet per nautical mile.
 - none of the above
24. (True or False) – Steep slips should be avoided with flap settings greater than 20 degrees.
25. Takeoff V_r (rotation speed) for 0 or 10 degrees flaps is ____
- 55 KIAS
 - 58 KIAS
 - 50 KIAS

26. The maximum demonstrated crosswind component for the Hawk XP is ____
- a. 20 knots
 - b. 12 knots
 - c. 15 knots
27. The trim systems are ____
- a. Elevator trim
 - b. Elevator trim and rudder trim
 - c. Elevator trim, rudder trim, and aileron trim
28. In all flight configurations, the stall warning horn will sound ____
- a. at 5 to 10 KIAS above the stall.
 - b. when the stall begins.
 - c. when entering a spin.
29. Various factors affect the stall speeds in aircraft. Stall speeds for a 2,550-pound Hawk with the most forward center of gravity is ____
- a. 54 KIAS indicated with flaps up and 0 degrees of bank
 - b. 58 KIAS indicated with flaps set at 30 degrees and 20 degrees of bank
 - c. 49 KIAS indicated with flaps set at 40 degrees and 30 degrees of bank
 - d. A and C
30. During runup and for takeoff, lean the fuel mixture for field elevation by setting ____
- a. 50 degrees F lean of peak Exhaust Gas Temperature
 - b. best power
 - c. 50 degrees F rich of peak Exhaust Gas Temperature
31. To see the current tach hours on the digital tachometer (Horizons P-1000), the pilot needs to ____
- a. Push the Hours button
 - b. Push and hold-in the Hours button
 - c. Simultaneous push the Hours and Trap button
32. The autopilot can be disengaged by ____
- a. Pushing the AP button on the GFC500
 - b. Pushing the red button (AP Disc) on the pilot's yoke
 - c. Pulling the Auto Pilot circuit breaker as a last resort
 - d. All of the above

33. The Hawk XP has _____

- a. manual (not automatic) fuel-mixture control
- b. constant-speed propeller
- c. cowl flap
- d. All of the above

34. The 'go around' push button on the instrument panel causes _____

- a. the flight director to display a pitch-up and a wing-level attitude
- b. the throttle to advance
- c. the autopilot to fly a missed approach
- d. the flaps to retract to 20 degrees

For questions 35 and 36, compute the takeoff distance at maximum gross weight with the following conditions:

5,000 ft MSL field

2,550 lbs (max gross weight)

Headwind 5 KIAS

67 degrees F (20 degrees C)

Grass Runway

Flaps 10 degrees

35. What is the ground roll?

- a. 1,315 feet
- b. 1,250 feet
- c. 1,437 feet

36. To clear 50-foot obstacle?

- a. 2,280 feet
- b. 2,491 feet
- c. 2,353 feet

For questions 37 - 39, what are the time, fuel, and distance for a Maximum rate of climb from sea level to a pressure altitude of 7,500 feet with flaps up and no wind?

37. Time?

- a. 10 minutes
- b. 11 minutes
- c. 12 minutes

38. Fuel?

- a. 2.7 gal
- b. 3.95 gal
- c. 4.15 gal

39. Distance?

- a. 9 nm
- b. 12 nm
- c. 15 nm

For questions 40 – 44, calculate the answers assuming cruise at these conditions:

Power 2600 RPM

Manifold Pressure 18 inches Hg

Cruise altitude 10,000 feet MSL

Maximum gross weight

45 gallons usable fuel remaining (after the climb)

Land with 45-minute reserve

Standard conditions with no wind

Disregard distance covered in climb and subsequent descent

40. Brake horsepower?

- a. 68 percent
- b. 61 percent
- c. 65 percent

41. GPH?

- a. 8.7
- b. 10.4
- c. 10.7

42. TAS, KIAS?

- a. 122
- b. 119
- c. 116

43. Range, nm?

- a. 575
- b. 513
- c. 445
- d. 540

44. Endurance, hours?

- a. 3.6
- b. 4.3
- c. 4.4

45. Compute the landing distance (ground roll) for the following conditions?

Pressure Altitude 5,000 feet; 10 degrees C.; Headwind of 9 kts, flaps 40 degrees

- a. 730 feet
- b. 657 feet
- c. 920 feet

46. Using the 1977 Cessna POH and the December 2021 Weight and Balance Update, in what category does the aircraft plot in the Center of Gravity Moment Envelope for the example shown below?

- a. Normal
- b. Utility
- c. Neither

Exam sample	Weight, pounds	Moment
Empty Weight	1629.2	
Pilot and Front Passenger	340	
Rear Passengers	170	
Baggage Area 1	50	
Total Fuel, 49 gallons	294	
Motor oil, 7 quarts	13	

Note: The December 2021 Weight and Balance Update (Avionics Specialists, LLC) for N736QC lists a basic empty weight of 1,629.2 lbs, a useful load of 920.8 lbs, and a maximum gross weight of 2,550 lbs.

OPTIONAL BONUS QUESTIONS

47. If landing with a flat main tire, the pilot should?
- a. Fly a normal approach speed, set full flaps, touch down on the good tire first, and use aileron control to hold the airplane off the flat tire as long as possible.
 - b. Use a soft field landing technique.
 - c. Divert to an airport equipped with an arresting cable.
48. V_x is the best angle of climb speed and results in ____
- a. The most altitude in a given amount of time
 - b. The greatest gain in altitude for a given horizontal distance
 - c. Neither a nor b above
49. V_y is the best rate of climb speed and results in ____
- a. The greatest gain in altitude for a given amount of time
 - b. The most altitude in a given distance
 - c. Neither a nor b above
50. The most current weather reporting, especially for winds, is typically reported by ____
- a. ATIS
 - b. AWOS/ASOS
 - c. Asking a controller for a wind check
 - d. Both answers b and c

USAF AERO CLUB KNOWLEDGE EXAM RECORD

Name: _____

Date Taken: _____

Type Exam: ____ Standardization

____ Make & Model: **C-172 Hawk XP**

Raw Score (%): _____

Date Corrected to 100%: _____

I certify all items were thoroughly debriefed and all questions answered.

Pilot's Signature

Instructor's Signature

1. (A) (B) (C) (D)
2. (A) (B) (C)
3. (A) (B) (C)
4. (A) (B) (C) (D)
5. (T) (F)
6. (A) (B) (C)
7. (T) (F)
8. (T) (F)
9. (A) (B) (C)
10. (A) (B) (C)
11. (A) (B) (C)
12. (A) (B) (C)
13. (T) (F)
14. (A) (B) (C)
15. (A) (B) (C)
16. (A) (B) (C)
17. (A) (B) (C)
18. (T) (F)
19. (T) (F)
20. (A) (B) (C) (D)
21. (A) (B) (C)
22. (A) (B) (C)
23. (A) (B) (C)
24. (T) (F)
25. (A) (B) (C)

26. (A) (B) (C)
27. (A) (B) (C)
28. (A) (B) (C)
29. (A) (B) (C) (D)
30. (A) (B) (C)
31. (A) (B) (C)
32. (A) (B) (C) (D)
33. (A) (B) (C) (D)
34. (A) (B) (C) (D)
35. (A) (B) (C)
36. (A) (B) (C)
37. (A) (B) (C)
38. (A) (B) (C)
39. (A) (B) (C)
40. (A) (B) (C)
41. (A) (B) (C)
42. (A) (B) (C)
43. (A) (B) (C) (D)
44. (A) (B) (C)
45. (A) (B) (C)
46. (A) (B) (C)
47. (A) (B) (C)
48. (A) (B) (C)
49. (A) (B) (C)
50. (A) (B) (C) (D)

Cessna C-172 Hawk XP CLOSED BOOK EXAM

Write the Emergency Action Procedures for the following:

Electrical Fire in Flight

1.
2.
3.

If fire appears is out and electrical power is needed:

4.
5.
6.
7.

Engine Fire in Flight

1.
2.
3.
4.
5.
6.
7.

Engine Failure in Flight

1.
2.
3.
4.
5.
6.
7.
8.

Fill in all the applicable blanks (KIAS)

1. V_A _____ at 2,550 lbs
2. V_A _____ at 2,150 lbs
3. V_A _____ at 1,750 lbs
4. V_{FE} _____ for all increments
5. Best Glide Speed ____ knots at maximum gross weight

NAME: _____

DATE: _____