

FLIGHT TRAINING GUIDE

CHAPTER 4



R22/R44

PILOT QUALIFICATION SYLLABUS

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ROBINSON HELICOPTER COMPANY
R22/R44 PILOT QUALIFICATION SYLLABUS

COURSE OBJECTIVES

The objective of this course is to qualify a helicopter pilot to act as pilot in command in the Robinson R22 or R44 helicopter. This course meets the experience and training requirements of FAA Special Federal Aviation Regulation (SFAR) 73.

COURSE COMPLETION STANDARDS

This course is successfully completed when the pilot passes the end of course written examination with a score of at least 80% and has satisfactorily completed the end of course flight evaluation. Standards found in the appropriate FAA Private/Commercial Practical Test Standards or foreign agency equivalent shall be used to determine satisfactory flight proficiency.

Pilots who have completed all ground and flight lessons in accordance with the completion standards are eligible for an instructor's endorsement to act as pilot in command. It is the instructor's responsibility to ensure satisfactory knowledge and proficiency prior to issuing the endorsement. A recommended endorsement is provided at the end of chapter 1 of this guide.

COURSE PREREQUISITES

This course is intended for pilots who hold a rotorcraft—helicopter category/class rating on their pilot certificate.

COURSE CONTENT

This course consists of six hours of ground training and ten hours of flight training. In accordance with SFAR 73, R44 pilots may credit five hours R22 experience towards the 10-hour R44 requirement. This credit may come from previous experience or as a part of this course if conducted in an R22 (the remaining five hours would then have to be conducted in an R44). Ground training lesson times may be adjusted by the instructor based on individual student needs, however, flight training hours are the minimum and students may require additional time to meet proficiency requirements. The flight and ground training can be conducted concurrently but, for pilots holding a U.S. pilot certificate who have not received the Awareness Training required by SFAR 73, ground lesson 1A must be accomplished prior to manipulating the controls. For pilots who do not hold a U.S. pilot certificate ground and flight hours may be adjusted to meet foreign agency requirements.

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STUDENT PROGRESS REPORT

Name _____

Ground Training

Lesson	Date Completed	Instructor Initials
1A.	_____	_____
1B.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

Flight Training

Lesson	Date Completed	Instructor Initials
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

Written examination results _____ Course completion date _____

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GROUND TRAINING**LESSON 1A**

0.5 Hours

OBJECTIVES

During this lesson the Awareness Training required by SFAR 73 paragraph 2(a)(3)(i-v) for pilots holding a U.S. pilot certificate who have not previously received the training will be completed.

LESSON CONTENT

1. SFAR 73 familiarization
2. Awareness Training
 - a. Energy Management
 - b. Mast Bumping
 - c. Low rotor RPM (rotor stall)
 - d. Low-G hazards
 - e. Rotor RPM decay

COMPLETION STANDARDS

The student will receive an instructor's logbook endorsement indicating completion of the required training.

INSTRUCTOR'S COMMENTS AND RECOMMENDATIONS:

GROUND TRAINING**LESSON 1B**

1.5 Hours

OBJECTIVES

During this lesson the student will be introduced to the R22/R44 systems and components.

LESSON CONTENT

1. Main rotor system
 - a. Type
 - b. Blade construction
 - c. Tri-hinge design
2. Tail rotor system
 - a. Type
 - b. Construction
 - c. Airfoil
3. Powerplant
 - a. Engine type
 - b. Horsepower—normal/MCP/5 min
 - c. How/why horsepower derating
 - d. Governor system
4. Fuel system
 - a. Quantity/type/color
 - b. Fuel pumps (R44 II)
 - c. Low fuel warning
5. Electrical system
 - a. Battery
 - b. Alternator
 - c. Lighting systems
6. Hydraulic system (R44 series)
 - a. Pump
 - b. Servos
 - c. Reservoir
7. Carburetor heat assist (R22, R44 I, and R44 cadet)
8. T-bar Cyclic
9. Optional equipment as appropriate

COMPLETION STANDARDS

This lesson will be complete when the student has gained an understanding of the R22/R44's systems.

INSTRUCTOR'S COMMENTS AND RECOMMENDATIONS:

GROUND TRAINING**LESSON 2**

2.0 Hours

OBJECTIVES

During this lesson the student will be introduced to the R22/R44 Pilot Operating Handbook and become familiar with its contents.

LESSON CONTENT

1. General
2. Limitations
3. Emergency procedures
4. Normal procedures
5. Performance
6. Weight & balance
7. Systems description
8. Handling and maintenance
9. Supplements (as appropriate)
10. Safety Information

COMPLETION STANDARDS

This lesson will be complete when the student has gained an understanding of the content and location of material in the appropriate Pilot's Operating Handbook. The student will be able to accurately calculate the aircraft weight & balance, determine proper performance parameters and become very familiar with the R22/R44's limitations/emergency procedures.

INSTRUCTOR'S COMMENTS AND RECOMMENDATIONS:

GROUND TRAINING**LESSON 3**

1.5 Hours

OBJECTIVES

During this lesson the student will review general subject areas that historical data have shown to be major contributors to helicopter accidents. These subject areas should be covered as appropriate to the student's experience level and planned operations.

LESSON CONTENT

1. Proper preflight planning
(Ref SNs 15, 26, & 43)
 - a. Thorough preflight inspection
 - b. Fuel/weather
 - c. Performance planning (hot/high/loading)
2. Carburetor ice
(SN 25, & 31)
 - a. Conditions conducive to ice
 - b. Use of carb heat assist
 - c. Calculating MP limits
3. Distractions
(Ref SNs 16, 34, 36, 41 & 44)
 - a. Continual scanning
 - b. High workload missions (photo flights)
 - c. Passengers
 - d. Avionics
 - e. Mobile phones
4. Low RPM
(Ref SNs 10, 24 & 29)
 - a. Causes
 - b. Recognition
 - c. Recovery
5. Low G and mast bumping
(Ref SNs 11, 20, 29 & 32)
 - a. Avoidance
 - b. Recognition
 - c. Recovery
6. Loss of outside visual reference
(Ref SNs 18, 19 & 26)
 - a. Seriousness of condition
 - b. Night flight (marginal weather, poorly lit terrain, over water)
 - c. Personal weather minimums
7. Vortex ring state
(Ref SNs 22 & 34)
 - a. Causes
 - b. Recognition
 - c. Vuichard/Traditional Recovery
8. Dynamic Rollover
(Ref SN 9)

COMPLETION STANDARDS

This lesson will be complete when the student understands the importance of these areas in preventing helicopter accidents.

INSTRUCTOR'S COMMENTS AND RECOMMENDATIONS:

GROUND TRAINING**LESSON 4**

0.5 Hour

OBJECTIVES

During this lesson the student will learn the proper R22/R44 preflight procedure.

LESSON CONTENT

1. Use of checklist
2. Preflight procedures
3. Cautions

COMPLETION STANDARDS

This lesson will be complete when the student can properly preflight an R22/R44.

INSTRUCTOR'S COMMENTS AND RECOMMENDATIONS:

GROUND TRAINING**LESSON 5**

0.5 Hour

OBJECTIVES

During this lesson the student will complete the R22/R44 Qualification written examination.

LESSON CONTENT

1. Written examination
2. Test correction
3. Explanations

COMPLETION STANDARDS

The ground training will be complete when the student scores 80% on the written examination.

INSTRUCTOR'S COMMENTS AND RECOMMENDATIONS:

NOTES:

NOTES:

FLIGHT TRAINING**LESSON 1**

1.0 Hour

OBJECTIVES

During this lesson the student will be introduced to the normal flight maneuvers in the R22/R44. Touchdown autorotations will be at the discretion of the instructor considering the appropriate regulatory requirements.

LESSON CONTENT

1. Before engine starting
2. Engine starting
3. Engine run-up
4. Air work
 - a. Straight & level
 - b. Turns
 - c. Climbs/descents
5. Hovering maneuvers
 - a. Forward, rearward, sideward
 - b. Hovering turns
6. Takeoffs
 - a. To a hover
 - b. Normal takeoff
 - c. Maximum performance takeoff
7. Approaches
 - a. Normal approach
 - b. Steep approach
 - c. Shallow approach
8. Landings
 - a. From a hover
 - b. Slope landings
 - c. Running landings
9. Traffic patterns
10. Autorotations
 - a. Straight in autorotations
 - i) Power recovery
 - ii) Touchdown (optional)
 - b. Hovering autorotations
11. Low RPM recognition/recovery
12. RPM control without the use of the governor
13. Engine shutdown

COMPLETION STANDARDS

This lesson will be complete when the student understands and has piloted the helicopter through all of the normal flight maneuvers.

INSTRUCTOR'S COMMENTS AND RECOMMENDATIONS:

FLIGHT TRAINING**LESSON 2**

1.0 Hour

OBJECTIVES

During this lesson the student will be introduced to advanced autorotations, reacting to engine failures, vortex ring state recognition/recovery and, for R44 students, hydraulic OFF landings.

LESSON CONTENT

1. Review normal maneuvers from lesson one
2. 180° autorotations
3. Maneuvering in autorotation (enhanced autorotation procedures)
 - a. Turns
 - b. Varying airspeed
 - c. Using pedals
4. Simulated engine failure
5. Vortex ring state
 - a. Causes
 - b. Recognition
 - c. Vuichard/traditional recovery
6. Hydraulics OFF approach and landing (R44)

COMPLETION STANDARDS

This lesson will be complete when the student is proficient at each of the flight tasks listed.

INSTRUCTOR'S COMMENTS AND RECOMMENDATIONS:

FLIGHT TRAINING**LESSON 3**

1.0 Hour

OBJECTIVES

This lesson will consist of operations without the use of the engine governor and a review of all maneuvers from lessons 1 and 2.

LESSON CONTENT

1. Governor OFF operations
 - a. Air work
 - b. Approach and landing
 - c. Governor failure
2. Review all maneuvers as necessary and provide additional instruction in areas where proficiency is lacking.

COMPLETION STANDARDS

This lesson will be complete when the student is proficient at all maneuvers in the R22/R44.

INSTRUCTOR'S COMMENTS AND RECOMMENDATIONS:

FLIGHT TRAINING**LESSON 4**

1.0 Hour

OBJECTIVES

During this lesson the student will be introduced to off airport operations in the R22/R44 and the importance of proper preflight planning.

LESSON CONTENT

1. Off airport operations
2. Proper preflight planning
(Ref SNs 15, 26 & 43)

COMPLETION STANDARDS

At the completion of this lesson the student will be proficient at off airport operations in the R22/R44 and understand the importance of proper preflight planning.

INSTRUCTOR'S COMMENTS AND RECOMMENDATIONS:

FLIGHT TRAINING**LESSON 5**

1.0 Hour

OBJECTIVES

The object of this lesson is for the instructor to determine the student's ability to safely act as pilot in command in an R22/R44. Use of the R22/R44 Pilot Qualification Flight Checklist may be helpful to the instructor.

LESSON CONTENT

1. All normal maneuvers (items 1 through 9 from lesson 1B)
2. Low RPM recognition and recovery
3. Autorotations
4. Vortex ring state—Vuichard/Traditional recovery
5. Governor OFF approach and landing
6. Hydraulics OFF approach and landing (R44)
7. Simulated engine failure

COMPLETION STANDARDS

At the completion of this lesson the student will demonstrate the ability to safely act as pilot in command in an R22 or R44. Standards found in the appropriate FAA Private/Commercial Practical Test/Airman Certification Standards or foreign agency equivalent shall be used to determine satisfactory flight proficiency.

INSTRUCTOR'S COMMENTS AND RECOMMENDATIONS:

NOTES:

R22/R44 PILOT QUALIFICATION FLIGHT CHECKLIST

Pilot Name _____ Instructor _____ Date _____

- Awareness training if applicable
- Engine starting/run-up
- Air work
- Hovering Maneuvers
- Takeoffs:
 - To a hover
 - Normal Takeoff
 - Maximum performance takeoff
- Approaches:
 - Normal approach
 - Steep approach
 - Shallow approach
 - Governor OFF/Failure
- Landings:
 - From a hover
 - Slope landing
 - Running Landing
 - Hydraulics OFF landing (R44)
- Autorotations—power recovery and/or touchdown:
 - Hovering autorotation
 - Straight-in
 - 180° Autorotation
 - Simulated engine failure
- Low RPM recognition/recovery
- Vortex ring state recovery:
 - Traditional
 - Vuichard
- Engine shut down

A recommended endorsement following completion of written examination and flight checklist is found at the end of Chapter 1 of this guide. It is the instructor's responsibility to insure satisfactory knowledge and proficiency prior to issuing the endorsement.

NOTES:

APPENDIX 1**R44 ASTRO/RAVEN I QUALIFICATION WRITTEN EXAMINATION**

In an effort to maximize the student's familiarity with the use of the Pilot's Operating Handbook in locating information, the POH may be used during the test. As changes to the POH occur, test questions may not be updated in a timely manner; consequently, a current POH will take precedence.

1. The R44 Astro/Raven I engine is derated to:
 - a. 210 BHP for maximum continuous power
 - b. 225 BHP five minute takeoff power
 - c. 250 BHP five minute takeoff power
 - d. 195 BHP for maximum continuous power

2. The maximum gross weight is:
 - a. 2000 lbs
 - b. 2200 lbs
 - c. 2600 lbs
 - d. 2400 lbs

3. The Vne above 2200 lbs is:
 - a. 130 KIAS
 - b. 100 KIAS
 - c. 120 KIAS
 - d. 115 KIAS

4. The Vne in autorotation is:
 - a. 100 KIAS
 - b. 120 KIAS
 - c. 130 KIAS
 - d. 115 KIAS

5. When operating at power above maximum continuous power the Vne is:
 - a. 120 KIAS
 - b. 130 KIAS
 - c. 110 KIAS
 - d. 100 KIAS

6. The maximum weight per seat is:
 - a. 240 lbs
 - b. 300 lbs
 - c. 260 lbs
 - d. There is no limit

7. The power off rotor limits are:
 - a. 90% – 108%
 - b. 99% – 102%
 - c. 97% – 108%
 - d. 97% – 102%

8. Low-G cyclic pushovers are:
 - a. Permitted at low airspeeds
 - b. Prohibited
 - c. Prohibited at weights above 2200 lbs
 - d. Permitted at all airspeeds

9. It is acceptable to solo from the right and left seats.
 - a. True
 - b. False

10. Which of the following must be operative for flight:
 - a. Heater
 - b. Vertical speed indicator
 - c. Alternator
 - d. Cigarette lighter

11. The R44 fuel usable capacity is (assume bladder-style fuel tanks; fuel tanks without bladders should no longer be in service):
 - a. 46.5 US gallons (176 liters)
 - b. 50.1 US gallons (190 liters)
 - c. 47.7 US gallons (180 liters)
 - d. 43.9 US gallons (166 liters)

12. Maximum glide distance configuration is:
 - a. 55 KIAS/97% rotor RPM
 - b. 55 KIAS/90% rotor RPM
 - c. 90 KIAS/97% rotor RPM
 - d. 90 KIAS/90% rotor RPM

13. If a total loss of tail rotor thrust occurs, the pilot should:
 - a. Reduce power and perform a running landing
 - b. Immediately enter autorotation
 - c. Land as soon as practical
 - d. Continue normal flight

14. The low fuel warning light comes on when there is approximately _____ remaining:
 - a. One gallon/5 minutes
 - b. Two gallons/5 minutes
 - c. Three gallons/10 minutes
 - d. Four gallons/10 minutes

15. If the MR CHIP light comes on during flight and is accompanied by a grinding noise and increased vibration, the pilot should:
- Land as soon as practical
 - Land immediately
 - Continue flight
 - Pull MR circuit breaker and continue flight
16. If the yellow clutch light comes on during flight and stays on for 10 seconds and the smell of hot rubber exists, the pilot should:
- Pull the clutch circuit breaker and land immediately
 - Immediately enter autorotation
 - Land as soon as practical
 - Continue flight
17. If full carb heat is applied, the engine produces less horsepower at a given manifold pressure, therefore the pilot:
- Should recalculate manifold pressure limits using the CAT
 - Should calculate manifold pressure limits using the OAT
 - May add 1.5 inches to the manifold pressure limit
 - May disregard the manifold pressure gauge since it's not accurate
18. The low RPM warning light and horn comes on at:
- 90%
 - 95%
 - 97%
 - 100%

Questions 19 and 20 require the use of the Limit Manifold Pressure and Never Exceed Speed charts.

At a pressure altitude of 4000 ft, + 10°C, & less than 2200 lbs gross weight

19. Find the 5 minute takeoff power:
- 23.8 inches
 - 23.4 inches
 - 24.7 inches
 - 23.1 inches
20. Find the never exceed speed:
- 130 KIAS
 - 120 KIAS
 - 117 KIAS
 - 126 KIAS

Questions 21 and 22 require the use of the IGE/OGE Hover Ceiling vs. Gross Weight charts; at a pressure altitude of 5000 ft and +10°C

21. Find the maximum weight to hover IGE:
 - a. 2200 lbs
 - b. 2250 lbs
 - c. 2300 lbs
 - d. 2400 lbs

22. Find the maximum weight to hover OGE:
 - a. 2180 lbs
 - b. 2300 lbs
 - c. 2400 lbs
 - d. 2250 lbs

23. The R44 RPM governor is only active above:
 - a. 80% rotor RPM
 - b. 80% engine RPM
 - c. 90% rotor RPM
 - d. 90% engine RPM

24. The landing lights operate only when clutch is in the engage position.
 - a. True
 - b. False

25. The main rotor blades are made of
 - a. Composite material
 - b. Composite and metal.
 - c. Metal
 - d. Tight grained wood

R44 ASTRO/RAVEN I WRITTEN EXAMINATION**Answer Key**

1. b
2. d
3. c
4. a
5. d
6. b
7. a
8. b
9. b
10. c
11. a
12. d
13. b
14. c
15. b
16. a
17. c
18. c
19. c
20. d
21. d
22. a
23. b
24. a
25. c

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APPENDIX 2**R44 RAVEN II QUALIFICATION WRITTEN EXAMINATION**

In an effort to maximize the student's familiarity with the use of the Pilot's Operating Handbook in locating information, the POH may be used during the test. As changes to the POH occur, test questions may not be updated in a timely matter; consequently, a current POH will take precedence.

1. The R44 Raven II engine is derated to:
 - a. 210 BHP for maximum continuous power
 - b. 245 BHP five minute takeoff power
 - c. 250 BHP five minute takeoff power
 - d. 195 BHP for maximum continuous power

2. The maximum gross weight is:
 - a. 2000 lbs
 - b. 2200 lbs
 - c. 2600 lbs
 - d. 2500 lbs

3. The Vne above 2200 lbs is:
 - a. 130 KIAS
 - b. 100 KIAS
 - c. 120 KIAS
 - d. 115 KIAS

4. The Vne in autorotation is:
 - a. 100 KIAS
 - b. 120 KIAS
 - c. 130 KIAS
 - d. 115 KIAS

5. When operating at power above maximum continuous power the Vne is:
 - a. 120 KIAS
 - b. 130 KIAS
 - c. 110 KIAS
 - d. 100 KIAS

6. The maximum weight per seat is:
 - a. 240 lbs
 - b. 300 lbs
 - c. 260 lbs
 - d. There is no limit

7. The power off rotor limits are:
 - a. 90% – 108%
 - b. 99% – 102%
 - c. 97% – 108%
 - d. 97% – 102%

8. Low-G cyclic pushovers are:
 - a. Permitted at low airspeeds
 - b. Prohibited
 - c. Prohibited at weights above 2200 lbs
 - d. Permitted at all airspeeds

9. It is acceptable to solo from the right and left seats.
 - a. True
 - b. False

10. The following must be operative for flight:
 - a. Heater
 - b. Vertical speed indicator
 - c. Alternator
 - d. Cigarette lighter

11. The R44 II fuel usable capacity is (assume bladder-style fuel tanks; fuel tanks without bladders should no longer be in service):
 - a. 46.5 US gallons (176 liters)
 - b. 50.1 US gallons (190 liters)
 - c. 47.7 US gallons (180 liters)
 - d. 43.9 US gallons (166 liters)

12. Maximum glide distance configuration is:
 - a. 55 KIAS/97% rotor RPM
 - b. 55 KIAS/90% rotor RPM
 - c. 90 KIAS/97% rotor RPM
 - d. 90 KIAS/90% rotor RPM

13. If a total loss of tail rotor thrust occurs, the pilot should:
 - a. Reduce power and perform a running landing
 - b. Immediately enter autorotation
 - c. Land as soon as practical
 - d. Continue normal flight

14. The low fuel warning light comes on when there is approximately _____ remaining:
 - a. One gallon/5 minutes
 - b. Two gallons/5 minutes
 - c. Three gallons/10 minutes
 - d. Four gallons/10 minutes

15. If the MR CHIP light comes on during flight and is accompanied by a grinding noise and increased vibration, the pilot should:
- Land as soon as practical
 - Land immediately
 - Continue flight
 - Pull MR circuit breaker and continue flight
16. If the yellow clutch light comes on during flight and stays on for 10 seconds and the smell of hot rubber exists, the pilot should:
- Pull the clutch circuit breaker and land immediately
 - Immediately enter autorotation
 - Land as soon as practical
 - Continue flight
17. Using the height-velocity chart, 350 ft and 25 kts is:
- Inside the shaded area at sea level
 - Outside the shaded area at sea level
 - Recommended for takeoff
 - Recommended for approach
18. The low RPM warning light and horn comes on at:
- 90%
 - 95%
 - 97%
 - 100%

Questions 19 and 20 require the use of the Limit Manifold Pressure and Never Exceed Speed charts; at a pressure altitude of 6000 ft, +10°C, & less than 2200 lbs gross weight

19. Find the 5 minute takeoff power:
- 21.0 inches
 - 23.4 inches
 - 23.8 inches
 - 23.1 inches
20. Find the never exceed speed:
- 130 KIAS
 - 120 KIAS
 - 126 KIAS
 - 117 KIAS

Questions 21 and 22 require the use of the IGE/OGE Hover Ceiling vs. Gross Weight charts; at a pressure altitude of 8000 ft and +30°C

21. Find the maximum weight to hover IGE:
 - a. 2200 lbs
 - b. 2250 lbs
 - c. 2300 lbs
 - d. 2400 lbs

22. Find the maximum weight to hover OGE:
 - a. 2100 lbs
 - b. 2300 lbs
 - c. 2400 lbs
 - d. 2250 lbs

23. The R44 RPM governor is only active above:
 - a. 80% rotor RPM
 - b. 80% engine RPM
 - c. 90% rotor RPM
 - d. 90% engine RPM

24. The landing lights operate only when clutch is in the engage position.
 - a. true
 - b. false

25. The main rotor blades are made of:
 - a. composite material
 - b. composite and metal
 - c. metal
 - d. tight grained wood

R44 RAVEN II WRITTEN EXAMINATION**Answer Key**

1. b
2. d
3. c
4. a
5. d
6. b
7. a
8. b
9. b
10. c
11. a
12. d
13. b
14. c
15. b
16. a
17. b
18. c
19. c
20. d
21. d
22. a
23. b
24. a
25. c

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APPENDIX 3**R44 CADET QUALIFICATION WRITTEN EXAMINATION**

In an effort to maximize the student's familiarity with the use of the Pilot's Operating Handbook in locating information, the POH may be used during the test. As changes to the POH occur, test questions may not be updated in a timely matter; consequently, a current POH will take precedence.

1. The R44 Cadet engine is derated to:
 - a. 205 BHP for maximum continuous power
 - b. 210 BHP five minute takeoff power
 - c. 200 BHP five minute takeoff power
 - d. 195 BHP for maximum continuous power

2. The maximum gross weight is:
 - a. 2000 lbs
 - b. 2400 lbs
 - c. 2600 lbs
 - d. 2200 lbs

3. The Vne is:
 - a. 130 KIAS
 - b. 100 KIAS
 - c. 120 KIAS
 - d. 115 KIAS

4. The Vne in autorotation is:
 - a. 100 KIAS
 - b. 120 KIAS
 - c. 130 KIAS
 - d. 115 KIAS

5. When operating at power above maximum continuous power the Vne is:
 - a. 120 KIAS
 - b. 130 KIAS
 - c. 110 KIAS
 - d. 100 KIAS

6. The maximum weight per seat is:
 - a. 240 lbs
 - b. 300 lbs
 - c. 260 lbs
 - d. There is no limit

7. The power off rotor limits are:
 - a. 90% – 108%
 - b. 99% – 102%
 - c. 97% – 108%
 - d. 97% – 102%

8. Low-G cyclic pushovers are:
 - a. Permitted at low airspeeds
 - b. Prohibited
 - c. Prohibited at weights above 2200 lbs
 - d. Permitted at all airspeeds

9. It is acceptable to solo from the right and left seats.
 - a. True
 - b. False

10. Which of the following must be operative for flight:
 - a. Heater
 - b. Vertical speed indicator
 - c. Alternator
 - d. Cigarette lighter

11. The R44 Cadet usable fuel capacity is:
 - a. 46.5 US gallons (176 liters)
 - b. 50.1 US gallons (190 liters)
 - c. 45.6 US gallons (166 liters)
 - d. 43.9 US gallons (166 liters)

12. Maximum glide distance configuration is:
 - a. 55 KIAS/97% rotor RPM
 - b. 55 KIAS/90% rotor RPM
 - c. 90 KIAS/97% rotor RPM
 - d. 90 KIAS/90% rotor RPM

13. If a total loss of tail rotor thrust occurs, the pilot should:
 - a. Reduce power and perform a running landing
 - b. Immediately enter autorotation
 - c. Land as soon as practical
 - d. Continue normal flight

14. The low fuel warning light comes on when there is approximately _____ remaining:
 - a. One gallon/5 minutes
 - b. Two gallons/5 minutes
 - c. Three gallons/10 minutes
 - d. Four gallons/10 minutes

15. If the MR CHIP light comes on during flight and is accompanied by a grinding noise and increased vibration, the pilot should:
- Land as soon as practical
 - Land immediately
 - Continue flight
 - Pull MR circuit breaker and continue flight
16. If the yellow clutch light comes on during flight and stays on for 10 seconds and the smell of hot rubber exists, the pilot should:
- Pull the clutch circuit breaker and land immediately
 - Immediately enter autorotation
 - Land as soon as practical
 - Continue flight
17. If full carb heat is applied, the engine produces less horsepower at a given manifold pressure, therefore the pilot:
- Should recalculate manifold pressure limits using the CAT
 - Should calculate manifold pressure limits using the OAT
 - May add 1.5 inches to the manifold pressure limit
 - May disregard the manifold pressure gage since it's not accurate
18. The low RPM warning light and horn comes on at:
- 90%
 - 95%
 - 97%
 - 100%

Questions 19 and 20 require the use of the Limit Manifold Pressure and Never Exceed Speed charts; at a pressure altitude of 4000 ft, +10°C

19. Find the 5 minute takeoff power:
- 21.3 inches
 - 23.4 inches
 - 23.3 inches
 - 22.1 inches
20. Find the never exceed speed:
- 120 KIAS
 - 112 KIAS
 - 107 KIAS
 - 116 KIAS

Questions 21 and 22 require the use of the IGE/OGE Hover Ceiling vs. Gross Weight charts; at a pressure altitude of 7000 ft and +20°C

21. Find the maximum weight to hover IGE:
 - a. 2100 lbs
 - b. 2050 lbs
 - c. 2150 lbs
 - d. 2200 lbs

22. Find the maximum weight to hover OGE:
 - a. 1970 lbs
 - b. 2200 lbs
 - c. 1900 lbs
 - d. 1890 lbs

23. The R44 RPM governor is only active above:
 - a. 80% rotor RPM
 - b. 80% engine RPM
 - c. 90% rotor RPM
 - d. 90% engine RPM

24. The landing lights operate only when clutch is in the engage position.
 - a. True
 - b. False

25. The main rotor blades are made of:
 - a. Composite material
 - b. Composite and metal
 - c. Metal
 - d. Tight grained wood

R44 CADET WRITTEN EXAMINATION

Answer Key

1. b
2. d
3. c
4. a
5. d
6. b
7. a
8. b
9. b
10. c
11. a
12. d
13. b
14. c
15. b
16. a
17. c
18. c
19. c
20. d
21. d
22. a
23. b
24. a
25. c

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APPENDIX 4

R22 QUALIFICATION WRITTEN EXAMINATION

(Assume R22 Beta II)

In an effort to maximize the student's familiarity with the use of the Pilot's Operating Handbook in locating information, the POH may be used during the test. As changes to the POH occur, test questions may not be updated in a timely matter; consequently, a current POH will take precedence.

1. The R22 Beta II engine is derated to:
 - a. 140 BHP for maximum continuous power
 - b. 131 BHP five minute takeoff power
 - c. 124 BHP five minute takeoff power
 - d. 180 BHP for maximum continuous power

2. The maximum gross weight is:
 - a. 1300 lbs
 - b. 1350 lbs
 - c. 1325 lbs
 - d. 1370 lbs

3. The Vne is:
 - a. 105 KIAS
 - b. 100 KIAS
 - c. 102 KIAS
 - d. 90 KIAS

4. VFR operations at night are permitted without an operable landing light.
 - a. False
 - b. True
 - c. True only when visibility exceeds 5 miles
 - d. False if the pilot has a hand held flashlight

5. The maximum weight in each baggage compartment is:
 - a. 25 lbs/11 kg
 - b. 60 lbs/27 kg
 - c. 30 lbs/14 kg
 - d. 50 lbs/23 kg

6. The maximum weight per seat is:
 - a. 250 lbs/114 kg
 - b. 240 lbs/109 kg
 - c. 260 lbs/118 kg
 - d. There is no limit

7. The power off rotor limits are:
 - a. 90% – 110%
 - b. 99% – 102%
 - c. 97% – 110%
 - d. 97% – 102%

8. Low-G cyclic pushovers are:
 - a. Permitted at low airspeeds
 - b. Prohibited
 - c. Prohibited at weights above 2200 lbs
 - d. Permitted at all airspeeds

9. It is acceptable to solo from the right and left seats.
 - a. True
 - b. False

10. Which of the following must be operative for flight:
 - a. Heater
 - b. Vertical speed indicator
 - c. Alternator
 - d. Cigarette lighter

11. The R22 with bladder-style fuel tanks has a usable fuel capacity of:
 - a. 26.3 US gallons (100 liters)
 - b. 50.1 US gallons (190 liters)
 - c. 29.7 US gallons (112 liters)
 - d. 43.9 US gallons (165 liters)

12. Maximum glide distance configuration is:
 - a. 75 KIAS/97% rotor RPM
 - b. 55 KIAS/90% rotor RPM
 - c. 53 KIAS/97% rotor RPM
 - d. 75 KIAS/90% rotor RPM

13. If a total loss of tail rotor thrust occurs, the pilot should:
 - a. Reduce power and perform a running landing
 - b. Immediately enter autorotation
 - c. Land as soon as practical
 - d. Continue normal flight

14. The low fuel warning light (assume bladder-style tanks) comes on when there is approximately _____ remaining:
 - a. Three gallon/7 minutes
 - b. Two gallons/5 minutes
 - c. One point five gallons/10 minutes
 - d. Four gallons/10 minutes

15. If the MR CHIP light comes on during flight and is accompanied by a grinding noise and increased vibration, the pilot should:
- Land as soon as practical
 - Land immediately
 - Continue flight
 - Pull MR circuit breaker and continue flight
16. If the yellow clutch light comes on during flight and stays on for 10 seconds and the smell of hot rubber exists, the pilot should:
- Pull the clutch circuit breaker and land immediately
 - Immediately enter autorotation
 - Land as soon as practical
 - Continue flight
17. If full carb heat is applied, the engine produces less horsepower at a given manifold pressure, therefore the pilot:
- Should recalculate manifold pressure limits using the CAT
 - Should calculate manifold pressure limits using the OAT
 - May add 1.5 inches to the manifold pressure limit
 - May disregard the manifold pressure gage since it's not accurate
18. The low RPM warning light and horn comes on at:
- 90%
 - 95%
 - 97%
 - 100%

Questions 19 and 20 require the use of the Limit Manifold Pressure and Never Exceed Speed charts; at a pressure altitude of 4000 ft, +10°C

19. Find the 5 minute takeoff power:
- 21.5 inches
 - 23.4 inches
 - 22.4 inches
 - 22.1 inches
20. Find the never exceed speed:
- 102 KIAS
 - 94 KIAS
 - 90 KIAS
 - 98 KIAS

Questions 21 and 22 require the use of the IGE/OGE Hover Ceiling vs. Gross Weight charts; at a pressure altitude of 7000 ft and +20°C

21. Find the maximum weight to hover IGE:
 - a. 1300 lbs
 - b. 1450 lbs
 - c. 1250 lbs
 - d. 1370 lbs

22. Find the maximum weight to hover OGE:
 - a. 1300 lbs
 - b. 1275 lbs
 - c. 1250 lbs
 - d. 1370 lbs

23. The R22 RPM governor is only active above:
 - a. 80% rotor RPM
 - b. 80% engine RPM
 - c. 90% rotor RPM
 - d. 90% engine RPM

24. The landing lights operate only when clutch is in the engage position.
 - a. True
 - b. False

25. The main rotor blades are made of:
 - a. Composite material
 - b. Composite and metal
 - c. Metal
 - d. Tight grained wood

R22 WRITTEN EXAMINATION

Answer Key

1. b
2. d
3. c
4. a
5. d
6. b
7. a
8. b
9. b
10. c
11. a
12. d
13. b
14. c
15. b
16. a
17. c
18. c
19. c
20. d
21. d
22. a
23. b
24. a
25. c

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