INSTRUCTOR RESOURCES
Chapter Review Questions

THE TURBINE PILOT'S FLIGHT MANUAL

Gregory N. Brown | Mark J. Holt

FIFTH EDITION

Includes all ATP-CTP topics

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The Turbine Pilot's Flight Manual
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by Gregory N. Brown and Mark J. Holt

Answer keys to these review questions and additional resources for instructors using *The Turbine Pilot's Flight Manual* textbook in their classrooms are available at **asa2fly.com/tpfm.**

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Preface

This document provides chapter review questions for *The Turbine Pilot's Flight Manual,* by Gregory N. Brown and Mark J. Holt, presented in a format useful for the classroom. This resource is intended for instructors as a tool to support their teaching when used in conjunction with *The Turbine Pilot's Flight Manual* textbook.

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NAME ______________________ DATE ______________

CHAPTER 1

Introduction

1. Which set of regulations do the commercial aircraft operations procedures in this book primarily reference?
   - ◯ a. 14 CFR Parts 135 and 121
   - ◯ b. 14 CFR Part 91
   - ◯ c. 14 CFR Part 117
   - ◯ d. 14 CFR Part 61

2. What is the most important topic impacting success in today's civilian aviation market, especially for transitioning military aviators?
   - ◯ a. Aircraft systems.
   - ◯ b. Crew resource management (CRM).
   - ◯ c. Checklist procedures.
   - ◯ d. Civilian aircraft identification.

3. What is recommended for transitioning military aviators to improve their civilian aircraft identification skills?
   - ◯ a. Attend a CRM workshop.
   - ◯ b. Read aviation forums.
   - ◯ c. Join online aviation magazines.
   - ◯ d. Review the Airline, Regional, and Business Aircraft Spotter's Guide (included in this text).

NAME ____________________ DATE ____________________

CHAPTER 2
General Preparations

1. What is the primary focus of indoctrination training for turbine aircraft pilots?
   - ◯ a. Aircraft systems and procedures.
   - ◯ b. Federal Aviation Regulations.
   - ◯ c. Crew coordination.
   - ◯ d. Simulator operations.

2. Why is extensive initial training required for Part 135 and Part 121 operations according to FARs?
   - ◯ a. To enhance safety.
   - ◯ b. To increase costs.
   - ◯ c. To discourage new pilots.
   - ◯ d. To limit pilot capabilities.

3. What limitations are important to learn in turbine aircraft training?
   - ◯ a. Crew coordination management.
   - ◯ b. Aircraft and engine limit weights, speeds, temperatures, capacities, and pressures.
   - ◯ c. Flight profiles and cockpit flows.
   - ◯ d. Simulator operations.

4. What is the purpose of simulator training in most regional and major airlines?
   - ◯ a. Primarily to reduce costs.
   - ◯ b. To replace ground school training.
   - ◯ c. To provide training in real-life abnormal flying scenarios without the actual dangers.
   - ◯ d. To avoid pilot checkrides.

5. What does "train to proficiency" mean in the context of ground school?
   - ◯ a. Memorization of all required information.
   - ◯ b. Instructors challenging pilots.
   - ◯ c. Student pilots must pass a computer-based training (CBT) exam.
   - ◯ d. Training with the goal of proper and effective learning for all pilots.

6. What is recommended for preparing for simulator and flight training?
   - ◯ a. Familiarize yourself using a mock-up cockpit procedures trainer (CPT).
   - ◯ b. Avoid any pre-training, as it may introduce bad habits.
   - ◯ c. Ignore crew coordination aspects until proficient in cockpit flow procedures.
   - ◯ d. Focus only on instrument flying competence.

7. Why is it important for pilots to be knowledgeable about computers during their aviation careers?
   - ◯ a. Due to the increased use of electronic flight bags (tablets) in everyday flight operations.
   - ◯ b. Because of the increasing computerization of aircraft flight management systems.
   - ◯ c. Due to increasing use of computer-based training in initial and continuing qualification training.
   - ◯ d. All of the above.

8. What is emphasized as one of the most addressable areas of flight safety in contemporary aviation?
   - ◯ a. Aircraft systems.
   - ◯ b. Crew resource management (CRM) and teamwork.
   - ◯ c. Simulator training.
   - ◯ d. Ground school preparation.

9. What is a potential consequence of driving under the influence (DUI) offenses for a pilot's career?
   - ◯ a. Enhanced job opportunities.
   - ◯ b. Improved flying skills.
   - ◯ c. Career advancement.
   - ◯ d. Difficulty in getting hired and termination during probation.

10. Why is it important for pilots to be sensitive to union issues when applying for jobs?
    - ◯ a. Unions determine pilot salaries and the quality of crew meals.
    - ◯ b. Discussing union matters may introduce potentially divisive topics that can create a negative perception of the applicant.
    - ◯ c. Unions are responsible for approving new hire pilot applicants.
    - ◯ d. Your union affiliation is a required part of the interview process.

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CHAPTER 3

Turbine Engine and Propeller Systems

1. What is the fundamental principle of jet propulsion in gas turbine engines according to Isaac Newton's third law?
   - ◯ a. Compression of intake air.
   - ◯ b. Action and reaction.
   - ◯ c. Combustion in the chamber.
   - ◯ d. Exhaustion of gases.

2. In gas turbine engines, how are compressors and turbines similar?
   - ◯ a. They both compress air in the combustion chamber.
   - ◯ b. They both use rotating bladed wheels.
   - ◯ c. They both drive the engine's accessories.
   - ◯ d. They both generate thrust directly.

3. What is the primary function of the turbines in a gas turbine engine?
   - ◯ a. Compress intake air.
   - ◯ b. Slow the exhaust airflow to subsonic speeds.
   - ◯ c. Drive the compressors and engine accessories.
   - ◯ d. Ignite the fuel in the combustion chamber.

4. How does a centrifugal-flow compressor differ from an axial-flow compressor in handling intake air?
   - ◯ a. Centrifugal-flow compressors throw air outward, while axial-flow compressors keep it essentially parallel to the engine axis.
   - ◯ b. Centrifugal-flow compressors direct air parallel to the engine axis, while axial-flow compressors throw air outward.
   - ◯ c. Both compressors throw air outward in a centrifugal pattern.
   - ◯ d. Both compressors keep air essentially parallel to the engine axis.

5. How do gas turbine engines differ from reciprocating engines in terms of continuous-flow conditions?
   - ◯ a. Gas turbine engines compress intake air with a piston.
   - ◯ b. Gas turbine engines operate under less efficient continuous-flow conditions.
   - ◯ c. Gas turbine engines use rotating bladed wheels in the compressor section.
   - ◯ d. Gas turbine engines do not have power strokes like reciprocating engines.

6. What drives the turbines in a gas turbine engine?
   - ◯ a. Ignition of fuel in the combustion chamber.
   - ◯ b. Exhaust gases passing through the turbine section.
   - ◯ c. Compressed air entering the combustion chamber.
   - ◯ d. Rotation of the compressor blades.

7. What is the primary function of turbines in a gas turbine engine besides driving the compressors?
   - ◯ a. Converting temperature to mechanical rotary motion.
   - ◯ b. Igniting fuel in the combustion chamber.
   - ◯ c. Driving engine accessories, such as electric generators and hydraulic pumps.
   - ◯ d. Compressing intake air.

8. Why do turboprops and many corporate jets use centrifugal-flow compressors?
   - ◯ a. Because they are more efficient.
   - ◯ b. Because they produce less noise.
   - ◯ c. Because they operate well at high altitudes.
   - ◯ d. Because they are more durable, especially for operations from unimproved airfields.

9. What is a significant advantage of axial-flow compressors over centrifugal-flow compressors?
   - ◯ a. Higher durability.
   - ◯ b. Higher compression ratio.
   - ◯ c. More efficient operation at unimproved airfields.
   - ◯ d. Reduced fuel efficiency.

10. How are the compressor components typically arranged in a multistage compressor?
    - ◯ a. Randomly.
    - ◯ b. In parallel.
    - ◯ c. Sequentially in line.
    - ◯ d. In a circular pattern.

11. What is the primary purpose of bypass air in a turbofan engine?
    - ◯ a. To cool the combustion chamber.
    - ◯ b. To generate thrust.
    - ◯ c. To increase noise levels.
    - ◯ d. To improve fuel efficiency.

12. What is the engine bypass ratio in a turbofan engine?
   - ◯ a. The ratio of high-pressure mass flow rate to low-pressure turbines mass flow rate.
   - ◯ b. The ratio of the flow of bypass air (through the fan disk) to the flow of air through the gas generator (engine core) portion of the engine.
   - ◯ c. The ratio of specific fuel consumption to net thrust.
   - ◯ d. The ratio of compression in the axial-flow compressor to that of the centrifugal-flow compressors.

13. What is the primary advantage of a geared turbofan engine (GTF) over conventional turbofan engines?
   - ◯ a. Higher RPM of the fan section.
   - ◯ b. A smaller fan diameter.
   - ◯ c. Reduced fuel consumption and noise.
   - ◯ d. Direct connection between the fan and low-pressure turbine.

14. In a free-turbine turboprop engine, how is thrust generated to drive the propeller?
   - ◯ a. By the compression of air in the combustion chamber.
   - ◯ b. By the direct connection to the high-pressure turbine.
   - ◯ c. By the absorption of energy in the core turbine.
   - ◯ d. By the rotation of the free power turbine.

15. How can you identify a free-turbine turboprop from a direct-drive turboprop after engine shutdown?
   - ◯ a. By the bypass ratio to the air intake pressure.
   - ◯ b. By the difference between the RPM of the propeller to that of the engine core.
   - ◯ c. By the length of the propeller blades divided by the width of each blade.
   - ◯ d. The propellers of a free-turbine turboprop rest in the "feathered" position.

16. In a direct-drive turboprop engine, how is thrust generated to drive the propeller?
   - ◯ a. By the compression of air in the compressor section which is then transferred to the diffuser spool.
   - ◯ b. By a gaseous fluidic coupling created by the engine's bypass ratio.
   - ◯ c. By the absorption of mass airflow at the engine's impeller.
   - ◯ d. Through a direct mechanical connection between the engine's turbine section and the propeller.

17. What is the purpose of start locks in direct-drive turboprops?
   - ◯ a. To lock the propeller blades in a high blade angle in case the engine fails in flight.
   - ◯ b. To prevent blade movement beyond a 90° angle of coincidence during shutdown.
   - ◯ c. To enhance air resistance during engine shutdown to enhance engine cooling.
   - ◯ d. To fix propeller blades at a 0° blade angle after shutdown to facilitate easy rotation during engine start-up.

18. Why do free-turbine turboprops not require start locks?
  - ○ a. Because they use electronic engine controls.
  - ○ b. Because there's no direct connection between propeller and engine core.
  - ○ c. Because they are high bypass ratio engines.
  - ○ d. Because they have a rigid connection between propeller and engine.

19. What parameter is commonly used for setting thrust in turboprop engines?
  - ○ a. EPR
  - ○ b. N_1
  - ○ c. Torque
  - ○ d. ITT (interstage turbine temperature)

20. What does EPR stand for in the context of jet engines?
  - ○ a. Engine power ratio
  - ○ b. Exhaust pressure regulation
  - ○ c. Engine pressure ratio
  - ○ d. External power ratio

21. What are the typical primary thrust-setting instruments for turbofan engines?
  - ○ a. EPR or N_1
  - ○ b. Np or ITT
  - ○ c. N_2 and manifold pressure
  - ○ d. ITT or EGT

22. What is the measure of power delivered by a turboprop engine to its propeller?
  - ○ a. Thrust
  - ○ b. EPR
  - ○ c. Shaft horsepower (shp)
  - ○ d. RPM

23. What is the purpose of a full authority digital engine control (FADEC)?
  - ○ a. To control propeller RPM and blade angle.
  - ○ b. To deliver fuel to the combustion chamber.
  - ○ c. To perform all engine management functions.
  - ○ d. To regulate intake airflow and exhaust gas temperature.

24. Why is it important to monitor engine RPM and temperature during turbine engine start?
  - ○ a. To ensure a smooth, constant engine RPM acceleration during the start-up process.
  - ○ b. To maximize fuel efficiency.
  - ○ c. To prevent foreign object damage.
  - ○ d. To calculate EPR.

25. What does the IFONE mnemonic stand for in the context of monitoring engine start parameters?
   - a. Intelligent Flight Observation for New Engines.
   - b. Ignition, Fuel flow, Oil pressure, N_1 rotation, Exhaust gas temperature.
   - c. Important Factors for Optimal Navigation Efficiency.
   - d. Internal Fuel Operation Navigation Elements.

26. What is the primary purpose of an auto-relight system in turbine engines?
   - a. Increase fuel efficiency.
   - b. Prevent engine flameouts.
   - c. Enhance engine power.
   - d. Reduce engine noise.

27. What is the consequence of an engine core lock in a turbine engine?
   - a. Increased fuel efficiency by diverting more bypass air.
   - b. Prevents engine rotation.
   - c. Increased air pressure in the compressor section.
   - d. Increased directional control.

28. What is the primary purpose of thrust reversers on turbine-powered aircraft?
   - a. Increase takeoff thrust.
   - b. Enhance acceleration during takeoff.
   - c. Improve fuel efficiency.
   - d. Enhance deceleration upon landing.

29. What does the term "beta range" refer to in turboprop systems?
   - a. Maximum power setting.
   - b. Cruise configuration.
   - c. Ground range with zero-thrust settings.
   - d. Reverse thrust range.

30. What is the purpose of propeller auto-feather systems on turboprops?
   - a. Increase propeller efficiency.
   - b. Reduce propeller noise.
   - c. Feather the propeller of a failed engine.
   - d. Synchronize propeller RPM.

NAME ______________________ DATE ______________________

CHAPTER 4
Turbine Aircraft Power Systems

1. What is the primary source of power for operating a flying turbine aircraft?
   - ○ a. Electrical power
   - ○ b. Hydraulic power
   - ○ c. Pilot's physical actuation
   - ○ d. Engine power

2. In the reference waterwheel system, what is the primary function of the reservoir?
   - ○ a. It regulates the flow of water to the waterwheel.
   - ○ b. It stores potential energy in the form of pressure.
   - ○ c. It converts the river's energy into mechanical energy.
   - ○ d. It prevents the waterwheel from failing in case of a power loss.

3. What is the main function of the generator in an aircraft's electrical power system?
   - ○ a. To pressurize the electrical system.
   - ○ b. To store electrical energy for backup.
   - ○ c. To convert AC to DC power.
   - ○ d. To provide current to power devices and maintain a constant voltage.

4. How is the battery in an aircraft best described in terms of its function?
   - ○ a. It acts as a primary power source for the entire electrical system.
   - ○ b. It stores electrical energy in chemical form and serves as a power reservoir.
   - ○ c. It generates electricity independently to power critical avionics.
   - ○ d. It functions as a backup for the aircraft's hydraulic system.

5. Which type of generator system utilizes a constant speed drive unit (CSD) to maintain a constant generator AC frequency output?
   - ○ a. Integrated drive generator (IDG)
   - ○ b. Variable-speed constant-frequency generator (VSCF)
   - ○ c. Variable-frequency generator (VFG)
   - ○ d. Alternating current (AC) generator

6. What is the battery's primary function in an aircraft electrical system?
   - ○ a. To generate electrical power.
   - ○ b. To store electrical energy.
   - ○ c. To regulate electrical flow.
   - ○ d. To control electrical circuits.

7. Why must the generator voltage overcome battery voltage in an aircraft electrical system?
   - ◯ a. To drain the battery.
   - ◯ b. To charge the battery.
   - ◯ c. To equalize voltages.
   - ◯ d. To reduce electrical load.

8. How are batteries in turbine aircraft rated?
   - ◯ a. In watts and volts.
   - ◯ b. In volts and amp-hours.
   - ◯ c. In ohms and volts.
   - ◯ d. In volts and farads.

9. What is the purpose of the amp-hour rating of a battery?
   - ◯ a. To measure voltage capacity.
   - ◯ b. To indicate the electrical load.
   - ◯ c. To estimate the battery's lifespan.
   - ◯ d. To determine the duration of power delivery.

10. What is the required minimum duration of battery operation under Federal Aviation Regulations in the event of a generator failure?
   - ◯ a. 15 minutes
   - ◯ b. 30 minutes
   - ◯ c. 45 minutes
   - ◯ d. 60 minutes

11. What characteristic makes batteries act as shock absorbers in electrical circuits?
   - ◯ a. Their ability to generate electricity.
   - ◯ b. Their chemical composition.
   - ◯ c. Their ability to absorb and release energy.
   - ◯ d. Their resistance to electrical flow.

12. What precaution is recommended to prevent thermal runaway in Ni-Cad batteries?
   - ◯ a. Keep the battery fully charged.
   - ◯ b. Deep-cycle the battery periodically.
   - ◯ c. Use the battery in high-temperature environments.
   - ◯ d. Avoid using ground power units (GPUs).

13. Why are lithium-ion batteries considered more environmentally friendly?
   - ◯ a. They are biodegradable.
   - ◯ b. They contain fewer toxic metals.
   - ◯ c. They have a shorter lifespan.
   - ◯ d. They are easier to dispose.

14. What is an "open" in the context of electrical faults in aircraft?
    - ◯ a. A surge of electrical energy.
    - ◯ b. A circuit with excessive resistance.
    - ◯ c. An uncommanded interruption of electrical supply.
    - ◯ d. A controlled disconnection of electrical components.

15. What is the potential effect of a "short" in an aircraft's electrical system?
    - ◯ a. Damage to associated electrical components.
    - ◯ b. Improved circuit efficiency.
    - ◯ c. Extended component lifespan.
    - ◯ d. Increased power generation.

16. How do diodes function in an aircraft's electrical system?
    - ◯ a. They limit current flow.
    - ◯ b. They allow electricity to flow in both directions.
    - ◯ c. They protect against one-way surges in current.
    - ◯ d. They act as circuit breakers.

17. What is a key safety feature of sophisticated aircraft electrical systems?
    - ◯ a. Low power consumption.
    - ◯ b. Redundancy.
    - ◯ c. Minimal circuit complexity.
    - ◯ d. Single power source.

18. Why are buses separated and interconnected via circuit protection devices in an aircraft's electrical system?
    - ◯ a. To enhance power generation.
    - ◯ b. To increase electrical resistance.
    - ◯ c. To prevent involving other buses in case of a fault.
    - ◯ d. To decrease power distribution.

19. What is the purpose of resettable circuit breakers (CBs) in an aircraft?
    - ◯ a. To disconnect individual components drawing too much current.
    - ◯ b. To provide constant power to all components.
    - ◯ c. To increase electrical resistance.
    - ◯ d. To isolate specific buses from one another.

20. Why is the return portion of electrical circuits not shown in aircraft electrical schematics?
    - ◯ a. It is unnecessary for understanding electrical circuit flow.
    - ◯ b. It is invisible to the naked eye.
    - ◯ c. There is no return circuit.
    - ◯ d. It is irrelevant to electrical systems.

21. Why do turbine-powered aircraft often come equipped with backup emergency-power generation systems?
    - ◯ a. To save fuel.
    - ◯ b. To reduce weight.
    - ◯ c. To meet airworthiness requirements for longer-range operations.
    - ◯ d. To enhance flight maneuverability.

22. Where is the auxiliary power unit (APU) typically located in an aircraft?
    - ◯ a. Avionics compartment
    - ◯ b. Nose
    - ◯ c. Tail
    - ◯ d. Forward cargo compartment

23. May an APU be started and operated in flight?
    - ◯ a. Only during aircraft maximum performance takeoffs.
    - ◯ b. Only during landing in dry conditions.
    - ◯ c. Only in emergency situations.
    - ◯ d. Most aircraft allow an APU to be used during flight.

24. What is the function of a hydraulic motor generator (HMG) in an aircraft?
    - ◯ a. To generate electrical power from hydraulic fluid.
    - ◯ b. To assist in a battery start of an engine.
    - ◯ c. To provide supplemental power to the APU.
    - ◯ d. To assist in landing gear retraction.

25. When might a ram air turbine (RAT) deploy to generate emergency electrical power?
    - ◯ a. During preflight inspection.
    - ◯ b. With the loss of all hydraulic power.
    - ◯ c. In the event of a complete loss of main engine-driven generators.
    - ◯ d. Only during takeoff and landing.

26. What principle forms the basis of hydraulic systems in large aircraft?
    - ◯ a. Fluids are flexible but noncompressible.
    - ◯ b. The inflexibility of fluids.
    - ◯ c. Movement of gases.
    - ◯ d. Vaporization of fluids.

27. Why is hydraulic power preferred for heavy-duty applications in larger airplanes?
    - ◯ a. It is more cost-effective.
    - ◯ b. It can be drawn directly from engine power.
    - ◯ c. Hydraulic fluid is more environmentally friendly.
    - ◯ d. Hydraulic power provides less mechanical advantage than electrical motors.

28. What is the purpose of a hydraulic accumulator in an aircraft system?
   - ◯ a. To store hydraulic fluid.
   - ◯ b. To provide backup power in case of a pump failure or when the pump is shut off.
   - ◯ c. To cool the hydraulic pump while warming the fuel temperature.
   - ◯ d. To measure hydraulic pressure and temperature.

29. Which backup hydraulic system is commonly found in smaller turbine-powered aircraft for landing gear extension?
   - ◯ a. Hydraulic hand pump.
   - ◯ b. Electrically driven hydraulic pump.
   - ◯ c. Hydraulic power transfer unit.
   - ◯ d. Air turbine hydraulic pump.

30. What is the primary medium for power transmission in pneumatic power systems for aircraft?
   - ◯ a. Hydraulic fluid.
   - ◯ b. Compressed air.
   - ◯ c. Electricity.
   - ◯ d. Fuel.

NAME ______________________________ DATE ____________________

CHAPTER 5
Major Aircraft Systems

1. What is the primary reason for the complexity of flight control systems in larger turbine-powered aircraft?
   - ◯ a. Increased fuel efficiency due to higher possible cruise altitudes.
   - ◯ b. Higher passenger capacity equals increased aircraft weights.
   - ◯ c. Aerodynamic challenges of high-speed cruise and slow flight for approach and landing.
   - ◯ d. Regulatory requirements dictate more complex flight control systems.

2. How do slotted flaps contribute to increased lift in turbine aircraft?
   - ◯ a. By increasing the wing's camber.
   - ◯ b. By decreasing the wing's surface area.
   - ◯ c. By creating gaps for fast-moving air.
   - ◯ d. By reducing the pressure on the upper portion of the wing.

3. What is the purpose of Fowler flaps on turbine aircraft?
   - ◯ a. To decrease wing surface area.
   - ◯ b. To increase wing camber.
   - ◯ c. To decrease drag during initial flap extension.
   - ◯ d. To decrease lift during midrange flap extension.

4. What is the function of auto-slat stall protection systems in some transport category aircraft?
   - ◯ a. Retracts flaps during high-speed flight.
   - ◯ b. Extends slats during landing.
   - ◯ c. Extends slats to enhance stall characteristics.
   - ◯ d. Prevents overspeed of flaps during descent.

5. Why do many turbine aircraft use roll spoilers?
   - ◯ a. To increase fuel efficiency.
   - ◯ b. To assist ailerons in roll control.
   - ◯ c. To reduce drag during descent.
   - ◯ d. To decrease lift during takeoff.

6. What is the purpose of ground spoilers on large aircraft during landing?
   - ◯ a. To increase lift upon touchdown.
   - ◯ b. To decrease drag for a smoother landing.
   - ◯ c. To dump lift, control landing distance, and improve braking.
   - ◯ d. To assist in banking for increased roll response.

7. Why do medium to large aircraft often require power-assisted controls?
   - ◯ a. To save fuel.
   - ◯ b. To increase speed.
   - ◯ c. Due to the heavy and distant placement of control surfaces.
   - ◯ d. To enhance pilot comfort.

8. What is the purpose of control tabs on certain large aircraft, such as the Boeing 717?
   - ◯ a. To directly control ailerons and elevators.
   - ◯ b. To mechanically connect pilot control yokes to control surfaces.
   - ◯ c. To assist in roll control.
   - ◯ d. To provide redundancy in the flight control system.

9. Why is redundancy important in the flight control system of aircraft certified under 14 CFR Part 25?
   - ◯ a. To increase aircraft speed.
   - ◯ b. To overcome flight control system jamming.
   - ◯ c. To reduce fuel consumption by reducing the size and drag of flight controls.
   - ◯ d. To simplify pilot training in regard to flight control systems knowledge.

10. What is a primary advantage of fly-by-wire control systems over conventional systems?
    - ◯ a. Increased aircraft weight.
    - ◯ b. Reduced pilot acceptance.
    - ◯ c. Varied control responses for different flight situations.
    - ◯ d. Greater cockpit and instrument panel space.

11. How is pressurization typically achieved in turbine aircraft?
    - ◯ a. By introducing compressed air from onboard tanks.
    - ◯ b. By a steady supply of engine bleed air.
    - ◯ c. By using electrically powered exhaust fans.
    - ◯ d. By adjusting the oxygen levels in the cabin.

12. What is the main measure of a pressurization system's efficiency?
    - ◯ a. Maximum altitude reached by the aircraft.
    - ◯ b. Maximum differential pressure.
    - ◯ c. Maximum cabin altitude attainable with the outflow valves closed.
    - ◯ d. Maximum cabin altitude attainable with the outflow valves open.

13. What is the main advantage of using electrically driven cabin air compressors (CACs) for cabin pressurization?
    - ◯ a. They provide faster pressurization.
    - ◯ b. They reduce engine fuel consumption.
    - ◯ c. They require increased maintenance.
    - ◯ d. They increase the efficiency of the air conditioning system.

14. Why is it important for an aircraft to land unpressurized or at a low predetermined pressurization value?
    - ◯ a. To reduce fuel consumption.
    - ◯ b. To prevent cabin stress on the fuselage.
    - ◯ c. To ease passenger disembarkation.
    - ◯ d. To avoid structural failure during a hard landing.

15. What is the purpose of positive pressure relief valves in the pressurization system?
    - ◯ a. To manually vent cabin pressurization in emergencies.
    - ◯ b. To prevent overpressurization in case of controller or outflow valve malfunction.
    - ◯ c. To ensure the cabin pressure never falls below ambient pressure.
    - ◯ d. To control the cabin rate of climb during descent.

16. Why are emergency descent maneuvers necessary in the event of a pressurization failure?
    - ◯ a. To reduce the time of useful consciousness for the flight crew and passengers.
    - ◯ b. To increase the airflow into the cabin negative pressurization outflow valve.
    - ◯ c. The flight crew must descend to reach the emergency maximum differential pressure possible.
    - ◯ d. The flight crew must be able to quickly and safely descend the airplane to an altitude where pressurization is not required.

17. Which type of oxygen system is commonly found on most general aviation aircraft and uses a simple on/off valve for oxygen flow control?
    - ◯ a. Diluter-demand system.
    - ◯ b. Pressure-demand system.
    - ◯ c. Continuous-flow system.
    - ◯ d. Fetzer-valve style oxygen system.

18. At what altitude do pilots using diluter-demand oxygen systems receive 100 percent oxygen automatically?
    - ◯ a. FL 350 (35,000 feet)
    - ◯ b. FL 500 (50,000 feet)
    - ◯ c. FL 250 (25,000 feet)
    - ◯ d. FL 100 (10,000 feet)

19. What is the mnemonic for the recommended preflight check for cockpit oxygen breathing systems, as suggested by the Federal Aviation Administration?
   - ◯ a. PERFORM
   - ◯ b. PRICE
   - ◯ c. PRESS
   - ◯ d. PRIOR

20. What is the primary source of heat for turbine environmental systems, as opposed to piston aircraft systems?
   - ◯ a. Filtered engine exhaust heat.
   - ◯ b. Combustion heaters.
   - ◯ c. Modified engine bleed air.
   - ◯ d. Gaseous oxygen heating systems.

21. What role do heat exchangers play in turbine environmental systems?
   - ◯ a. Generate heat for the cabin.
   - ◯ b. Absorb and remove heat in various applications.
   - ◯ c. Provide cooling without using external air.
   - ◯ d. Act as compressors for bleed air.

22. What is the basic operating principle of air and vapor cycle machines?
   - ◯ a. Compression heats gas, expansion cools it.
   - ◯ b. Compression cools gas, expansion heats it.
   - ◯ c. Both compression and expansion heat gas.
   - ◯ d. Compression and expansion have no effect on temperature.

23. Why are air cycle machines (ACMs) more common than vapor cycle machines (VCMs) in larger turbine aircraft?
   - ◯ a. ACMs are more efficient.
   - ◯ b. ACMs require more bleed air.
   - ◯ c. ACMs are less expensive.
   - ◯ d. ACMs are better suited for smaller aircraft.

24. What is the advantage of vapor cycle machines (VCMs) over air cycle machines (ACMs)?
   - ◯ a. Lower cost.
   - ◯ b. Can handle a much higher volume of engine bleed air.
   - ◯ c. May only be operated in flight.
   - ◯ d. Compatibility with large turbine engines.

25. What is the purpose of collector bays in the fuel system of a turbine aircraft?
  - ◯ a. To collect head pressure air from the air cycle machine.
  - ◯ b. To increase fuel efficiency.
  - ◯ c. To prevent fuel interruption to the engines during aircraft movement.
  - ◯ d. To act as surge tanks for over-fueling situations.

26. What is the purpose of motive flow in turbine aircraft fuel systems?
  - ◯ a. To drive the main fuel pumps.
  - ◯ b. To cool the fuel.
  - ◯ c. To draw fuel into collection lines.
  - ◯ d. To remove water and particulates from the fuel.

27. What is the function of a fuel control unit (FCU)?
  - ◯ a. To measure fuel quantity in pounds.
  - ◯ b. To manage fuel vents.
  - ◯ c. To deliver fuel to the engine based on various inputs.
  - ◯ d. To warm the fuel and prevent crystallization.

28. What is the purpose of crossfeed valves in aircraft?
  - ◯ a. To measure fuel quantity.
  - ◯ b. To deliver fuel to the engine compartment.
  - ◯ c. To transfer fuel from one side of the aircraft to the other.
  - ◯ d. To shut off fuel supply during emergency engine shutdown.

29. What is the primary purpose of fuel heaters in turbine aircraft?
  - ◯ a. They assist in the measurement of fuel mass.
  - ◯ b. To prevent engine flameout.
  - ◯ c. To balance lateral fuel loads.
  - ◯ d. To facilitate fuel flow during takeoff.

30. How is fuel quantity measured in large turbine aircraft?
  - ◯ a. Using fuel quantity measuring sticks.
  - ◯ b. Using capacitance fuel quantity indicator systems.
  - ◯ c. Using FADECs and FCU hydromechanical calculations.
  - ◯ d. Measuring fuel flow through the fuel dump valves.

NAME ______________________ DATE ______________

CHAPTER 6

Dedicated Aircraft Systems

1. What is the key difference between deice and anti-ice systems in aircraft?
   - ◯ a. Deice systems are designed to remove ice that has already accumulated, while anti-ice systems prevent icing before it occurs.
   - ◯ b. Deice systems prevent icing before it occurs, while anti-ice systems remove ice that has already accumulated.
   - ◯ c. Deice systems are designed for ground use, while anti-ice systems are for in-flight use only.
   - ◯ d. Deice and anti-ice systems are interchangeable and serve the same purpose.

2. What is the primary purpose of pneumatic leading edge deice boots?
   - ◯ a. To prevent the formation of ice.
   - ◯ b. To remove ice that has already accumulated.
   - ◯ c. To cycle automatically at regular time intervals.
   - ◯ d. To draw engine power for thermal anti-icing.

3. Under what conditions are bleed air thermal leading edge anti-ice systems usually turned on?
   - ◯ a. When outside air temperatures are above +10°C.
   - ◯ b. When icing conditions exist (visible moisture and outside air temperatures below +10°C).
   - ◯ c. When severe icing pilot weather reports are received.
   - ◯ d. When pneumatic leading edge deice boots are ineffective.

4. Why are electrically heated deicing boots generally not used on large surfaces like wing leading edges?
   - ◯ a. They are too heavy for large surfaces.
   - ◯ b. They draw too much electrical current.
   - ◯ c. They are less effective than other anti-icing systems.
   - ◯ d. They cannot be cycled automatically.

5. How do inertial separators (ice vanes) in some turboprop engines address the release of ice chunks under icing conditions?
   - ◯ a. They automatically close to prevent ice release.
   - ◯ b. They are spring-loaded to open only when foreign object damage occurs.
   - ◯ c. They are manually opened by the pilot under potential icing conditions.
   - ◯ d. They are permanently kept open to expel ice at all times.

6. What is a common approach to combat jet fuel crystallization due to low temperatures in the fuel system?
   - ◯ a. Using fuel to cool engine oil and circulate the warmer fuel back into the fuel tanks.
   - ◯ b. Putting the deice boots system on automatic.
   - ◯ c. Turning the wing anti-ice system on before the fuel temperatures get below 10°C.
   - ◯ d. Using heavy-duty fuel filters to remove ice crystals.

7. Why are landing gear squat switches crucial in preventing inadvertent gear retraction on the ground?
   - ◯ a. They operate the brake cooling fans only when sufficient weight is sensed on the landing gear.
   - ◯ b. They provide power to the hydraulic landing gear system.
   - ◯ c. They are mechanically actuated by the weight of the airplane, preventing gear retraction when there is sufficient weight on the squat switches.
   - ◯ d. They control the brake antiskid systems.

8. What safety function does the landing gear squat switch serve in relation to ground spoilers?
   - ◯ a. Prevents ground spoilers deploying during landing.
   - ◯ b. Prevents ground spoilers from deploying in flight.
   - ◯ c. Controls ground spoiler operation during taxi.
   - ◯ d. Prevents ground spoiler deployment during a rejected takeoff.

9. What is the primary purpose of brake cooling fans on some aircraft?
   - ◯ a. To assist in keeping the brakes clean.
   - ◯ b. To cool the brake assemblies more rapidly than passive cooling.
   - ◯ c. To provide additional reverse thrust during landing rollout.
   - ◯ d. To reduce the effectiveness of antiskid systems.

10. What is a drawback of carbon brakes compared to steel brakes?
    - ◯ a. Carbon brakes are prone to more wear when cold.
    - ◯ b. Carbon brakes are more resistant to corrosion from deicing fluids.
    - ◯ c. Carbon brakes are less expensive.
    - ◯ d. Carbon brakes are less susceptible to wear during taxi.

11. Why are tailskids used on aircraft, particularly those with stretched fuselages?
    - ◯ a. To improve nosewheel steering.
    - ◯ b. To assist in slowing the aircraft during landing rollout.
    - ◯ c. To prevent structural damage during tail strikes.
    - ◯ d. To aid in landing gear retraction.

12. What is the function of an automatic brake system in aircraft?
   - ◯ a. To automatically deploy thrust reversers during landing.
   - ◯ b. To provide automatic speed brake deployment in flight.
   - ◯ c. To deliver a preselected rate of deceleration during landing rollout.
   - ◯ d. To cool the brakes rapidly using external fans.

13. What is the purpose of annunciator or advisory panels in the cockpit?
   - ◯ a. To control the aircraft systems.
   - ◯ b. To alert pilots to system problems.
   - ◯ c. To adjust cockpit lighting.
   - ◯ d. To manage radio communication.

14. What color are warning lights in the cockpit, and what type of situations do they indicate?
   - ◯ a. Yellow, indicating possible future issues.
   - ◯ b. Blue, indicating normal system operation.
   - ◯ c. Red, indicating emergencies requiring immediate action.
   - ◯ d. Green, indicating noncritical system statuses.

15. What is the purpose of a master caution light in the cockpit?
   - ◯ a. To indicate the forward lavatory is occupied.
   - ◯ b. To prevent the illuminations of any warning lights.
   - ◯ c. To draw attention to an illuminated caution annunciator.
   - ◯ d. To indicate normal system operation.

16. What do caution lights indicate in a turbine aircraft?
   - ◯ a. Immediate emergency action required.
   - ◯ b. Eventual illumination of the master warning lights.
   - ◯ c. Normal system operation.
   - ◯ d. Nonemergency system malfunctions requiring prompt action.

17. Which warning system is designed to alert pilots when an aircraft is not properly configured for takeoff?
   - ◯ a. Traffic collision avoidance system (TCAS).
   - ◯ b. Terrain awareness and warning system (TAWS).
   - ◯ c. Takeoff configuration warning system (TOCWS).
   - ◯ d. Automatic takeoff warning system (ATWS).

18. What is the purpose of an altitude alerting system in the cockpit?
   - ◯ a. To indicate engine fire.
   - ◯ b. To warn of an approaching stall.
   - ◯ c. To alert when leaving or approaching a set altitude.
   - ◯ d. To indicate landing gear status.

19. Which term is an example of a crew alerting system that integrates information on multifunction display screens?
   - ◯ a. Electronic centralized aircraft monitoring (ECAM).
   - ◯ b. Master warning and master caution light control panel.
   - ◯ c. Annunciator light panel.
   - ◯ d. Takeoff configuration warning system (TOCWS).

20. What does a red status light on an annunciator panel indicate?
   - ◯ a. Immediate action required.
   - ◯ b. Possible future issues.
   - ◯ c. Normal system operation.
   - ◯ d. Abnormal system conditions.

21. How is fire detection accomplished in turbine engine compartments?
   - ◯ a. By visual inspection through a transparent window.
   - ◯ b. Through a system of fire loops.
   - ◯ c. Using a dedicated video camera.
   - ◯ d. Thermometers placed at strategic locations.

22. What is the purpose of a Nitrogen Generating System (NGS) in fire protection?
   - ◯ a. To provide additional fuel for the engines.
   - ◯ b. To reduce the flammability of aircraft fuel tanks.
   - ◯ c. To generate electrical power in case of a fire.
   - ◯ d. To cool down the engine components.

23. What is the primary action a pilot should take in the event of an engine fire?
   - ◯ a. Activate the Nitrogen Generating System.
   - ◯ b. Deploy the oxygen masks.
   - ◯ c. Pull the fire handle.
   - ◯ d. Turn off the engine master switch.

24. How are lavatory waste smoke detectors different from cockpit smoke detectors?
   - ◯ a. Lavatory waste smoke detectors trigger waste-bin fire extinguishers.
   - ◯ b. Cockpit smoke detectors are not battery-operated.
   - ◯ c. Lavatory smoke detectors have cockpit indications.
   - ◯ d. Cockpit smoke detectors are activated by heat.

25. In the event of an APU fire, what functions do automatic self-extinguishing systems typically perform?
   - ◯ a. Open air intake doors.
   - ◯ b. Cut off fuel to the APU engine.
   - ◯ c. Activate the oxygen masks.
   - ◯ d. Deploy smoke hoods.

26. What is the purpose of portable breathing equipment (PBE) in the cockpit?
   - ◯ a. To provide extra oxygen during high-altitude flights.
   - ◯ b. To provide backup portable pressurization.
   - ◯ c. To protect against harmful gases during an emergency smoke and fumes event.
   - ◯ d. To facilitate communication between pilots.

27. What is the purpose of an angle of attack (AOA) indicating system in an aircraft?
   - ◯ a. To measure the outside air temperature (OAT).
   - ◯ b. To determine the ambient static pressure.
   - ◯ c. To give the pilot better stall-margin awareness than using indicated airspeed alone.
   - ◯ d. To detect the presence of ice on the aircraft.

28. Which of the following probes measures the temperature and pressure of the air as it enters the intake of the turbine engine?
   - ◯ a. Outside air temperature (OAT) probe.
   - ◯ b. Ice detecting probe.
   - ◯ c. Total air temperature probe (TAT).
   - ◯ d. Static probe.

29. What is the primary function of drain masts on an aircraft?
   - ◯ a. To measure the impact pressure of the force of air against a moving aircraft.
   - ◯ b. To drain fluids that might build up inside the belly of the fuselage.
   - ◯ c. To detect the presence of ice on the aircraft.
   - ◯ d. To compensate for errors in altitude and airspeed measurements.

30. What is the primary purpose of an air data computer (ADC) in aircraft?
   - ◯ a. To operate raw pitot/static systems and compensate for errors caused by low dynamic pressure.
   - ◯ b. To compensate for altitude, airspeed, and other pitot/static errors that can be caused by high dynamic air pressure.
   - ◯ c. To enhance the visibility and readability of LCD cockpit display units.
   - ◯ d. To measure and display Mach numbers accurately.

NAME ____________________ DATE ____________________

CHAPTER 7
Limitations

1. What types of limitations are considered in the design of every airplane?
   - ◯ a. Airspeed and engine parameters.
   - ◯ b. Structural and system limitations.
   - ◯ c. Operating temperatures, fuel type, and weight and balance limitations.
   - ◯ d. All of the above.

2. How do airspeed limitations in turbine aircraft differ from those in piston aircraft?
   - ◯ a. Turbine aircraft have a redline on the airspeed indicator.
   - ◯ b. Turbine aircraft are limited by V_{NE}.
   - ◯ c. Turbine aircraft have no fixed redline airspeed, using V_{MO} and M_{MO} instead.
   - ◯ d. Turbine aircraft have lower stall and minimum single-engine control speeds.

3. What does the "barber pole" on the airspeed indicator of a turbine aircraft represent?
   - ◯ a. Stall speed.
   - ◯ b. Maximum cruising speed.
   - ◯ c. Maximum operating limit speed.
   - ◯ d. V_{NE} (never exceed speed).

4. What is the significance of Mach number in jet speeds, and how is it displayed?
   - ◯ a. Describes airspeed relative to the speed of sound; displayed on the Machmeter.
   - ◯ b. Describes airspeed in knots; displayed on the airspeed indicator.
   - ◯ c. Describes altitude relative to the speed of sound; displayed on the altitude indicator.
   - ◯ d. Describes vertical speed; displayed on the vertical speed indicator.

5. What is the purpose of the weight-dependent maneuvering speed (V_A) in a turbine aircraft?
   - ◯ a. Maximum speed for landing.
   - ◯ b. Maximum speed for climbs in icing conditions.
   - ◯ c. Maximum speed for maneuvers without exceeding the limit load factor.
   - ◯ d. Maximum speed for effective use of windshield heat.

6. How are tailwind takeoff and landing limitations determined for turbine-powered aircraft?
   - ◯ a. Fixed at 10 knots for all situations.
   - ◯ b. Depend on aircraft type and company regulations.
   - ◯ c. Determined by runway slope angle.
   - ◯ d. Exclusively based on runway width.

7. What does the term “factor of safety” refer to in the context of aircraft design?
   - ◯ a. The maximum stress an aircraft can withstand.
   - ◯ b. The ratio of maximum stress to the stress estimated for design.
   - ◯ c. The load factor along the vertical axis.
   - ◯ d. The stall speed during 1G, wings-level flight.

8. According to 14 CFR Part 25 regulations, what are the load factor limits for transport category airplanes?
   - ◯ a. −1 to +2.5 Gs (flaps and slats up).
   - ◯ b. +1.52 to +3.8 Gs.
   - ◯ c. −2 to +4 Gs.
   - ◯ d. −1 to +1.5 Gs.

9. What is the significance of V_A (maneuvering airspeed) in the flight maneuvering envelope?
   - ◯ a. V_A is the designed maximum airspeed prior to the start of Mach buffet.
   - ◯ b. V_A is the airspeed where maximum maneuvering airspeed equals maximum designed dive airspeed.
   - ◯ c. V_A allows for full travel of a control surface from one extreme to another in all directions and the aircraft will stall before bending aluminum.
   - ◯ d. V_A is the maximum airspeed that permits full travel of a control surface in one direction only, returning to neutral without causing structural failure.

10. What risk is associated with exceeding the designed dive speed (V_D) according to the text?
    - ◯ a. At higher airspeeds, the margin of safety increases.
    - ◯ b. Mach buffet, wing flutter, and disaster.
    - ◯ c. Flight control aerodynamic reversal.
    - ◯ d. Gust load capability increases beyond design limits.

11. What do yellow arcs on engine instruments typically depict?
    - ◯ a. Normal operating ranges.
    - ◯ b. Caution or limited operating ranges.
    - ◯ c. Absolute limits.
    - ◯ d. Prohibited ranges.

12. Which engine temperature is mentioned as crucial for turbine engines, and what are the two possible indicators depending on the aircraft?
    - ◯ a. Exhaust gas temperature (EGT) or interstage turbine temperature (ITT).
    - ◯ b. Oil crossfeed indication.
    - ◯ c. Intake air pressure indication.
    - ◯ d. Interstage intake air temperature indication.

13. What is the significance of a “hot start” during engine start-up?

- ◯ a. It indicates excessive engine RPM.
- ◯ b. It suggests a high oil temperature.
- ◯ c. EGT or ITT surpasses normal start-up values and heads toward redline.
- ◯ d. It is a normal part of the engine start-up process.

14. What is the primary concern if any redline is exceeded in a turbine aircraft?

- ◯ a. Increased fuel consumption.
- ◯ b. Engine vibration.
- ◯ c. Engine or structural damage.
- ◯ d. Oil contamination.

15. What is the primary purpose of anti-icing systems in turbine aircraft?

- ◯ a. To reduce engine temperatures.
- ◯ b. To prevent fuel crystallization.
- ◯ c. To prevent engine and structural icing by activating in visible moisture at temperatures below +10°C.
- ◯ d. To improve lift at lower airspeeds.

16. Why do some aircraft have restrictions on holding with flaps extended?

- ◯ a. To prevent fuel crystallization on the tailplane.
- ◯ b. To avoid engine overheating.
- ◯ c. Due to the risk of ice formation on the wings.
- ◯ d. To improve fuel economy.

17. What is the potential consequence of exceeding certain weights in an aircraft with regard to airspeed?

- ◯ a. Dynamic instability.
- ◯ b. Inability to fly slower than 250 KIAS.
- ◯ c. Lower stall speed.
- ◯ d. Fuel crystallization.

18. Why might speed brakes be prohibited below 1,000 feet AGL in many aircraft?

- ◯ a. To reduce fuel consumption.
- ◯ b. To prevent engine overheating.
- ◯ c. To ensure a stabilized landing approach.
- ◯ d. To improve lift during landing.

19. What does V_{LE} refer to in the context of landing gear limits?

- ◯ a. Maximum airspeed for landing gear extended.
- ◯ b. Maximum altitude for landing gear extension.
- ◯ c. Maximum speed for retracting landing gear.
- ◯ d. Maximum speed for extending landing gear.

20. What is the purpose of minimum brake release fuel or minimum fuel for takeoff limitations?

- ◯ a. The use of the minimum amount of fuel possible during takeoff.
- ◯ b. To prevent fuel crystallization during takeoff.
- ◯ c. To use the maximum amount of fuel for takeoff.
- ◯ d. To help ensure an adequate amount of fuel for the planned flight is on board at takeoff.

NAME ______________________ DATE ______________

CHAPTER 8
Normal Procedures

1. What is the primary responsibility of the pilot flying (PF) in a multi-pilot crew?
   - ◯ a. Reading and performing checklist items.
   - ◯ b. Operating radios and handling systems abnormalities.
   - ◯ c. Flying and maintaining safe control of the aircraft.
   - ◯ d. Obtaining weather and flight information.

2. In multi-pilot operations, what is the primary role of the pilot monitoring (PM)?
   - ◯ a. Flying and maintaining safe control of the aircraft.
   - ◯ b. Calling for checklists and double-checking their execution.
   - ◯ c. Performing all duties other than flying, such as handling systems abnormalities.
   - ◯ d. Monitoring the aircraft and system states.

3. What does CRM (crew resource management) focus on in the context of aviation?
   - ◯ a. Efficient use of all available resources to achieve safe and efficient flight.
   - ◯ b. Exclusive reliance on the captain's experience and knowledge level.
   - ◯ c. Strict separation of duties between captain and first officer.
   - ◯ d. Single-pilot operations to reduce the risk of miscommunication.

4. What is the primary goal of crew resource management (CRM) training?
   - ◯ a. Reduction of accidents caused by mechanical problems.
   - ◯ b. Elimination of the need for multi-pilot crews.
   - ◯ c. Optimization of communication between crew members.
   - ◯ d. Development of individual technical skills.

5. Why is the captain's role crucial in improving communication in the cockpit?
   - ◯ a. The captain performs all communication tasks during a flight.
   - ◯ b. The captain sets the tone in the cockpit and must encourage open communication.
   - ◯ c. The captain is solely responsible for decision-making.
   - ◯ d. The captain delegates communication tasks to the first officer.

6. What is one way the captain contributes to improving overall flight management in CRM programs?
   - ◯ a. Flying the aircraft and dealing with emergency events only.
   - ◯ b. Delegating primary flight duties and secondary flight duties.
   - ◯ c. Maintaining a preoccupation with minor issues.
   - ◯ d. Ignoring the importance of situational awareness.

7. What was the major factor that led to the accident of Eastern Airlines Flight 401, according to the NTSB?
   - ◯ a. The pilot flying's lack of stick and rudder flying skills.
   - ◯ b. Autopilot malfunction.
   - ◯ c. The flight crew's preoccupation with a minor landing gear malfunction.
   - ◯ d. The pilot monitoring's lack of stick and rudder flying skills.

8. In the example of United Airlines Flight 232, what was the unique approach taken by the flight crew to control the aircraft after a catastrophic engine failure and resultant loss of flight control usage?
   - ◯ a. Activating the aircraft's autopilot.
   - ◯ b. Adjusting the thrust of wing-mounted engines.
   - ◯ c. Ignoring the off-duty check airman's assistance.
   - ◯ d. Flying the aircraft in a circular pattern for an extended period.

9. What is the primary objective of crew resource management (CRM)?
   - ◯ a. Achieving crew harmony.
   - ◯ b. Enhancing basic stick and rudder flying skills.
   - ◯ c. Improving overall flight crew proficiency and efficiency.
   - ◯ d. Focusing on individual technical skills with the flight management computer.

10. What is the FAA's emphasis on leadership and professional development training for airline transport pilots (ATP) intended to achieve?
    - ◯ a. Foster unprofessional pilot behavior.
    - ◯ b. Increase the level of safety by mitigating unprofessional behavior.
    - ◯ c. Reduce the importance of standard operating procedures (SOPs).
    - ◯ d. Minimize the role of leadership in flight crew settings.

11. How is responsibility defined in the context of the text?
    - ◯ a. The quality or state of being responsible, limited to moral accountability.
    - ◯ b. The quality or state of being responsible, including moral, legal, or mental accountability.
    - ◯ c. The act of being accountable for legal matters only.
    - ◯ d. The act of being accountable for mental matters only.

12. What is the primary regulatory responsibility of the pilot-in-command (PIC) during flight, as outlined in 14 CFR §91.3(a)?
    - ◯ a. Safety of the passengers, crewmembers, cargo, and airplane.
    - ◯ b. Enforcing organizational standards.
    - ◯ c. The operation of the aircraft.
    - ◯ d. Decision-making during flight time.

13. What is the significance of situational awareness (SA) in making sound decisions according to the text?
   - ◯ a. It involves focusing solely on one perceived important item to enhance decision-making.
   - ◯ b. It is not crucial to maintaining sound decisions.
   - ◯ c. It requires an accurate perception of various flight-related factors to understand their impact on the flight.
   - ◯ d. It is unrelated to the decision-making process.

14. How does mentoring contribute to enhancing pilot professionalism, according to the FAA?
   - ◯ a. Mentoring is not considered a valuable skill for pilots.
   - ◯ b. Mentoring skills are solely for non-technical or "soft skills."
   - ◯ c. Mentoring complements other related pilot-in-command (PIC) non-technical or "soft skills."
   - ◯ d. Mentorship is only required for first officers.

15. What is the key responsibility emphasized for professional pilots in terms of their actions, both on-duty and off-duty?
   - ◯ a. To be as visible as possible to represent the aviation industry.
   - ◯ b. To communicate trust and professionalism at all times.
   - ◯ c. To maintain a pattern of inappropriate behavior.
   - ◯ d. To be less visible while off-duty.

NAME ______________________________ DATE ______________________

CHAPTER 9

Emergency and Abnormal Procedures

1. What is the key factor that makes emergency training challenging for pilots?
   - ◯ a. Frequent occurrences of emergencies.
   - ◯ b. Routine use of emergency procedures.
   - ◯ c. Infrequent and unpredictable occurrences of emergencies.
   - ◯ d. Dependence on checklists and manuals.

2. How do “abnormal” situations and procedures compare to “emergencies?”
   - ◯ a. Abnormal situations are more serious and always require immediate action.
   - ◯ b. Abnormal situations require instant action, similar to emergencies.
   - ◯ c. Abnormal situations need attention but not immediate action.
   - ◯ d. Abnormal procedures are only relevant to specific aircraft designs.

3. In the context of emergency procedures, what are “boxed items” on checklists?
   - ◯ a. Non-critical items.
   - ◯ b. Urgent follow-up procedures.
   - ◯ c. Memory items, to be called out and performed immediately.
   - ◯ d. Items requiring confirmation by the crew.

4. Why is it important for the pilot flying (PF) to focus on flying the airplane during an emergency?
   - ◯ a. To ensure the emergency checklist is followed accurately.
   - ◯ b. To free up the pilot monitoring (PM) to handle the emergency.
   - ◯ c. To delegate emergency responsibilities to the captain.
   - ◯ d. To allow time for looking up the emergency checklist.

5. How are emergency checklists differentiated for quick identification?
   - ◯ a. They use large, carefully laid-out type.
   - ◯ b. They have a green border.
   - ◯ c. They contain only non-urgent procedures.
   - ◯ d. They are marked with blue borders.

6. What does the last memory item on every emergency checklist instruct the crew to do?
   - ◯ a. Execute less-urgent follow-up procedures.
   - ◯ b. Confirm completion of memory items.
   - ◯ c. Call for the applicable emergency checklist.
   - ◯ d. Focus on flying the airplane.

7. What is the first action a pilot should take in the event of an aborted engine start?
   - ◯ a. Apply maximum braking.
   - ◯ b. Disconnect autothrottles/autothrust.
   - ◯ c. Retard thrust/power levers to idle.
   - ◯ d. Place fuel control switch to off position.

8. At what airspeed range is the pilot-in-command (PIC) advised to abort a takeoff for specific reasons such as fire warning or visible fire?
   - ◯ a. 0 to 80 knots.
   - ◯ b. 80 knots to V_1.
   - ◯ c. Above V_1 airspeed.
   - ◯ d. 100 knots to 150 knots.

9. What is the first action the pilot flying should take in an Aircraft Upset Recovery Training (AUPRT) situation?
   - ◯ a. Disengage the autopilot system.
   - ◯ b. Push the pitch control forward to "unload" the wing.
   - ◯ c. Add power/thrust to ensure the aircraft doesn't stall.
   - ◯ d. Roll the wings level with the horizon.

10. In the case of airspeed unreliable conditions, what is the recommended action to stabilize the aircraft temporarily?
    - ◯ a. Extend ground spoilers.
    - ◯ b. Set thrust to idle, neutralize the ailerons, and pitch for 0°.
    - ◯ c. Set thrust and pitch to a predetermined "memory item" setting such as 75% N_1 and pitch up of 5°.
    - ◯ d. Turn off the flight director system.

11. What is the initial step for a pilot in the event of a single engine failure during cruise flight (drift-down maneuver)?
    - ◯ a. Declare an emergency with ATC.
    - ◯ b. Leave autopilot engaged.
    - ◯ c. Extend speed-brake lever.
    - ◯ d. Rotate to a pitch attitude that maintains an airspeed of V_2.

12. In the event of an engine failure on takeoff just before V_1 speed (V_1 Cut), what is the recommended action at a safe altitude above 400 feet?
    - ◯ a. Declare an emergency with ATC.
    - ◯ b. Accelerate to pattern airspeed.
    - ◯ c. Rotate to a pitch attitude that maintains V_2.
    - ◯ d. Perform the Engine Failure checklist.

13. What action should be taken just prior to glideslope or VNAV path intercept during an engine-out instrument approach?
    - ◯ a. Extend landing gear.
    - ◯ b. Set airspeed for the engine-out landing flap setting.
    - ◯ c. Perform the landing checklist.
    - ◯ d. All of the above.

14. Above what altitude should the pilot inform ATC of a go-around or missed approach during engine-out operations?
    - ◯ a. 100 feet
    - ◯ b. 200 feet
    - ◯ c. 400 feet
    - ◯ d. 600 feet

15. During engine-out go-around, when should the landing gear be retracted?
    - ◯ a. Immediately after go-around button pressed.
    - ◯ b. As soon as the aircraft achieves a positive rate of climb.
    - ◯ c. At an intermediate altitude of 1,000 feet.
    - ◯ d. Only if instructed by ATC.

16. What is the purpose of setting rudder trim during engine-out maneuvers?
    - ◯ a. To control aileron input.
    - ◯ b. To minimize elevator input.
    - ◯ c. To counteract asymmetric thrust.
    - ◯ d. To assist in flaps extension.

17. In the event of engine fire, what should be done with the autothrottle/autothrust system?
    - ◯ a. Select off.
    - ◯ b. Increase power to maximum.
    - ◯ c. Engage autopilot.
    - ◯ d. Ignore it.

18. How should a pilot respond to a TCAS system command to climb or descend during an instrument or visual approach?
    - ◯ a. Disengage autopilot and follow RA command.
    - ◯ b. Ignore the command until getting clearance from ATC.
    - ◯ c. Engage autopilot and maintain current altitude.
    - ◯ d. Descend immediately.

19. What is the recommended action if the TCAS system alerts that you are "Clear of conflict" while on an instrument approach?
   - ◯ a. Inform ATC of RA maneuvering.
   - ◯ b. Reestablish automation (engage autopilot and autothrust).
   - ◯ c. Perform a normal go-around or missed approach.
   - ◯ d. All of the above.

20. What should a pilot do during a reactive wind shear event below 1,500 feet AGL?
   - ◯ a. Increase airspeed to maximum.
   - ◯ b. Perform a normal go-around.
   - ◯ c. Advance the thrust or power levers full forward/TOGA.
   - ◯ d. Lower flaps to full.

21. What is a significant concern for the FAA based on the analysis of the last decade's accident data?
   - ◯ a. Engine failures during flight.
   - ◯ b. Loss of control in-flight (LOC-I) accidents.
   - ◯ c. Controlled flight into terrain (CFIT) incidents.
   - ◯ d. Communication breakdowns between air traffic control and pilots.

22. According to the FAA, what is a recurring causal factor in LOC-I accidents and incidents?
   - ◯ a. Engine malfunctions.
   - ◯ b. Inadequate weather forecasting.
   - ◯ c. The pilot's inappropriate reaction to stalls.
   - ◯ d. Lack of automation systems.

23. What recent change has been made in FAA-required stall training?
   - ◯ a. Emphasizing the use of autopilot during stalls.
   - ◯ b. Focusing on minimizing altitude loss during stall recovery.
   - ◯ c. Prioritizing the reduction of the aircraft's angle of attack (AOA).
   - ◯ d. Allowing pilots to use "powering out of a stall" technique.

24. What is the purpose of the stall warning systems mentioned in the text?
   - ◯ a. To warn about approaching thunderstorms.
   - ◯ b. To indicate low fuel levels.
   - ◯ c. To provide advance notice of an impending stall.
   - ◯ d. To alert pilots about potential bird strikes.

25. What is the primary focus during stall recovery, regardless of altitude or attitude?
  - a. Minimizing any altitude loss.
  - b. Autopilot engagement.
  - c. Angle of attack (AOA) reduction.
  - d. Roll control.

26. What is the primary goal of Upset Prevention and Recovery Training (UPRT)?
  - a. To enhance pilot communication skills.
  - b. To improve passenger comfort during turbulence.
  - c. To prevent, recognize, and recover from airplane upsets.
  - d. To increase aircraft speed during recovery maneuvers.

27. What is the significance of disconnecting the autopilot and autothrust during stall recovery, according to the stall recovery template?
  - a. It increases workload for the pilot.
  - b. It prevents inadvertent changes or adjustments.
  - c. It helps maintain a constant pitch attitude.
  - d. It assists in achieving maximum thrust.

28. How does the recovery strategy recommend handling the bank angle during stall recovery?
  - a. Increase the bank angle for improved recovery.
  - b. Maintain wings level.
  - c. Apply nose-up pitch control.
  - d. Use speed brakes/spoilers.

29. Why is it essential to retract speed brakes/spoilers during the stall recovery process?
  - a. To increase thrust.
  - b. To reduce drag and improve lift.
  - c. To induce a nose-up pitching moment.
  - d. To avoid secondary stalls.

30. What is the definition of an airplane upset, according to the text?
  - a. Any deviation from the intended flight path.
  - b. A condition in which an airplane intentionally exceeds normal flight parameters.
  - c. Flight outside industry standard parameters during normal operations.
  - d. An unplanned and inadvertent deviation from normal flight parameters.

NAME ____________________ DATE ____________________

CHAPTER 10
Performance

1. What are the major performance planning issues for turbine aircraft according to the text?
   - ◯ a. Turbulence penetration speed.
   - ◯ b. Takeoff, climb, landing, and engine-out situations.
   - ◯ c. Passenger load factor.
   - ◯ d. Maximum engine limitations.

2. In turbine aircraft, why do runway length requirements, especially for jets, tend to be much greater than for piston aircraft?
   - ◯ a. Turbine aircraft have lower installed power.
   - ◯ b. Turbine aircraft operate closer to their limits.
   - ◯ c. Turbine aircraft have lower weight.
   - ◯ d. Turbine aircraft have better takeoff performance.

3. What is the purpose of V_1 in turbine aircraft takeoff planning?
   - ◯ a. Minimum takeoff safety speed.
   - ◯ b. Takeoff rotation speed.
   - ◯ c. The takeoff go or no-go decision speed.
   - ◯ d. The maximum rate of climb speed.

4. How does increasing flap angle affect the rotation speed (V_R) in turbine aircraft takeoff?
   - ◯ a. Increases V_R.
   - ◯ b. Decreases V_R.
   - ◯ c. Has no effect on V_R.
   - ◯ d. Reduces V_2.

5. What is V_2 in turbine aircraft takeoff planning?
   - ◯ a. Takeoff rotation speed.
   - ◯ b. Takeoff decision speed.
   - ◯ c. Minimum takeoff safety speed.
   - ◯ d. The maximum rate of climb speed in takeoff configuration.

6. What factor does *not* affect V_R speed during takeoff for turbine aircraft?
   - ◯ a. Aircraft weight.
   - ◯ b. Flap setting.
   - ◯ c. Runway slope.
   - ◯ d. Wind conditions.

7. What does V_2 allow the aircraft to maintain in the event of an engine failure during takeoff?
   - ○ a. Cruise speed.
   - ○ b. Maximum angle of climb.
   - ○ c. FAA-required climb gradient.
   - ○ d. Landing speed.

8. Why do turbine aircraft pilots and/or their performance planners sometimes adjust V_1 to a lower speed than the balanced field length V_1?
   - ○ a. To increase acceleration during takeoff.
   - ○ b. To allow for higher-speed aborts as long as the aircraft is equipped with an autobrake system.
   - ○ c. For most turbine aircraft, it is safer to continue takeoff after engine failure than to abort and try to safely stop the aircraft on the remaining runway.
   - ○ d. To improve climb performance in the second segment of the climb.

9. What is the most restrictive performance factor for turbine-powered aircraft during departure, especially at high density altitudes and in mountainous terrain?
   - ○ a. Landing performance.
   - ○ b. Takeoff rotation speed.
   - ○ c. Engine-out climb gradient.
   - ○ d. Cruise altitude.

10. How can pilots ensure adequate engine-out climb performance during departure for turbine-powered aircraft?
   - ○ a. Increase takeoff weight.
   - ○ b. Minimize fuel.
   - ○ c. Restrict loading of fuel, passengers, and cargo.
   - ○ d. Increase takeoff speed.

11. Define V_{REF} in landing performance planning for turbine aircraft?
   - ○ a. Landing rotation engine failure speed.
   - ○ b. Minimum takeoff safety speed.
   - ○ c. Landing reference speed.
   - ○ d. Engine-inoperative best rate of climb speed.

12. What is the primary purpose of Takeoff and Landing Data cards (TOLD cards)?
   - ○ a. To provide in-flight entertainment options.
   - ○ b. To calculate airspeeds for takeoff and landing based on aircraft weight and conditions.
   - ○ c. To serve as a checklist for flight crews during takeoff and landing.
   - ○ d. To determine the fuel consumption of the aircraft.

13. How do Airport Analysis Tables assist flight crews?
    - ◯ a. By depicting the maximum rate of climb speed for various aircraft weights.
    - ◯ b. By providing information on airport traffic delays.
    - ◯ c. By calculating required aircraft performance for specific runways under current conditions.
    - ◯ d. By suggesting alternative airports for landing in case of emergencies.

14. In the context of cruise performance, why do turbine engines present challenges in fuel planning?
    - ◯ a. Turbine engines are equally fuel-efficient at all altitudes.
    - ◯ b. Turbine engines consume less fuel at lower altitudes.
    - ◯ c. Turbine engines burn much more fuel at lower altitudes.
    - ◯ d. Turboprops have high noise levels in the cabin.

15. What is the purpose of temperature-derived reduced thrust takeoff?
    - ◯ a. To minimize engine wear and noise during takeoff.
    - ◯ b. To minimize fuel consumption during takeoff.
    - ◯ c. To calculate maximum takeoff thrust for every flight.
    - ◯ d. To comply with FAA regulations for runway length requirements.

16. When are reduced thrust procedures not permitted?
    - ◯ a. During sunny weather conditions.
    - ◯ b. When the runway is contaminated with snow, ice, slush, and/or standing water.
    - ◯ c. When the aircraft is equipped with anti-skid brakes.
    - ◯ d. During maximum takeoff thrust situations.

17. How does derated thrust differ from temperature-derived reduced thrust?
    - ◯ a. Derated thrust involves reducing engine wear during flight.
    - ◯ b. Derated thrust is calculated based on ambient temperature.
    - ◯ c. Derated thrust is a fixed value of thrust reduction without temperature consideration.
    - ◯ d. Derated thrust is only available during the takeoff segment of the departure.

18. What is the main purpose of an electronic flight bag (EFB)?
    - ◯ a. To replace the aircraft avionics system.
    - ◯ b. To enhance pilot comfort during flights.
    - ◯ c. To perform functions traditionally done with paper references.
    - ◯ d. To display current news and sports information for relay to the passengers.

19. How are electronic flight bags (EFBs) commonly provided to pilots?
   - ◯ a. Integrated with the aircraft avionics system.
   - ◯ b. Issued as a smartphone app.
   - ◯ c. Purchased by the flight department.
   - ◯ d. Downloaded from the internet.

20. In the context of energy management, what does potential energy refer to in aviation?
   - ◯ a. Stored chemical energy.
   - ◯ b. Stored altitude energy.
   - ◯ c. Moving object energy.
   - ◯ d. Energy produced through combustion.

21. How is kinetic energy calculated for an aircraft?
   - ◯ a. KE = Mass × Height
   - ◯ b. KE = ½ Mass × Velocity^2
   - ◯ c. KE = Weight × Height
   - ◯ d. KE = Mass × Speed

22. What is the primary reason for operating at high cruising altitudes?
   - ◯ a. To avoid turbulence.
   - ◯ b. For better fuel efficiency.
   - ◯ c. To reduce engine wear.
   - ◯ d. To increase airspeed.

23. What is Max L/D (maximum lift over drag) associated with on the total drag curve?
   - ◯ a. The point of minimum drag and maximum efficiency.
   - ◯ b. The highest point of induced drag.
   - ◯ c. The region of reversed command.
   - ◯ d. The point of maximum engine thrust.

24. How should pilots handle a slow-speed buffet at high altitude?
   - ◯ a. Initiate a rapid pitch-up maneuver.
   - ◯ b. Reduce angle of attack and initiate a descent.
   - ◯ c. Maintain altitude and increase thrust.
   - ◯ d. Ignore the buffet and continue flying.

25. What is the main distinction between jet aircraft and turboprop aircraft in propulsion terms?
   - ◯ a. Jet engines produce power, while turboprop engines produce thrust.
   - ◯ b. Jet engines produce thrust, while turboprop engines produce power.
   - ◯ c. Both jet and turboprop engines produce thrust. Only piston engines produce power.
   - ◯ d. Both jet and propeller engines produce a lot of noise.

26. Why do propeller aircraft engines fall under the category of power producers?
   - ◯ a. Propeller aircraft engines produce power for electrical systems.
   - ◯ b. Propeller engines directly generate thrust from the engine.
   - ◯ c. Power is produced to turn the propeller, which generates thrust.
   - ◯ d. Power is used to increase the aircraft's speed.

27. What is the primary factor that distinguishes jet aircraft from propeller aircraft when analyzing drag curves?
   - ◯ a. Jet aircraft have steeper thrust-producing drag curves at slow speeds.
   - ◯ b. Propeller aircraft have steeper power-producing drag curves at slow speeds.
   - ◯ c. Both jet and propeller aircraft have similar drag curves.
   - ◯ d. Propeller aircraft require high thrust settings for slow-speed flight.

28. When discussing V_{BE} (best endurance airspeed), what determines the airspeed for jet aircraft?
   - ◯ a. The maximum speed achieved in level flight.
   - ◯ b. The airspeed providing the maximum lift-to-drag ratio.
   - ◯ c. The airspeed at which the engines consume the least fuel per unit of time.
   - ◯ d. The airspeed that minimizes drag.

29. What is the cost index (CI) used for in aircraft performance considerations?
   - ◯ a. It determines the maximum speed an aircraft can achieve.
   - ◯ b. It balances fuel cost against other operating costs to determine the most cost-effective cruise airspeed.
   - ◯ c. It indicates the cost of maintaining an aircraft's engines.
   - ◯ d. It calculates the optimum altitude for fuel efficiency.

30. In terms of flight economy, how does a lower cost index (CI) affect airspeed and fuel consumption?
   - ◯ a. Low CI results in higher airspeed and lower fuel consumption.
   - ◯ b. Low CI leads to lower airspeed and lower fuel consumption.
   - ◯ c. CI has no effect on airspeed or fuel consumption.
   - ◯ d. Low CI increases both airspeed and fuel consumption.

NAME ______________________ DATE ______________

CHAPTER 11
Weight and Balance

1. What is maximum zero-fuel weight (MZFW)?
   - ◯ a. The maximum allowable aircraft weight including fuel.
   - ◯ b. The most an aircraft is certified to weigh for takeoff.
   - ◯ c. The greatest allowable weight for landing.
   - ◯ d. The maximum allowable aircraft weight excluding fuel.

2. What is maximum takeoff weight (MTOW)?
   - ◯ a. The most an aircraft is certified to weigh for takeoff.
   - ◯ b. The greatest allowable weight for landing.
   - ◯ c. The maximum an aircraft may weigh while parked, taxiing, or running up.
   - ◯ d. The maximum allowable aircraft weight excluding fuel.

3. What is maximum landing weight (MLW)?
   - ◯ a. The maximum allowable aircraft weight excluding fuel.
   - ◯ b. The most an aircraft is certified to weigh for takeoff.
   - ◯ c. The maximum allowable weight for landing.
   - ◯ d. The most a given aircraft may weigh while parked, taxiing, or running up.

4. What is the purpose of maximum ramp weight?
   - ◯ a. To ensure that cabin loads do not overstress the wings.
   - ◯ b. To allow for the large amounts of fuel carried and consumed during a flight.
   - ◯ c. To determine the maximum weight excluding fuel.
   - ◯ d. To account for the weight of fuel burned during taxi and run-up while parked, taxiing, or running up before takeoff.

5. How is center of gravity (CG) location described for many large aircraft?
   - ◯ a. In terms of the distance between datum and the angle of coincidence.
   - ◯ b. As a percentage of maximum landing weight (MLW).
   - ◯ c. In terms of loading stations.
   - ◯ d. In terms of maximum takeoff weight (MTOW).

6. What is the performance benefit of flying with an aft CG (center of gravity)?
   - ◯ a. Faster cruise and better climb rate.
   - ◯ b. Slower cruise and reduced climb rate.
   - ◯ c. No impact on aircraft performance.
   - ◯ d. Increased fuel consumption.

7. Why does loading a plane near aft CG limits result in faster cruise?
   - ◯ a. Because it increases tail-down force, improving lift.
   - ◯ b. Due to reduced tail-down force (less drag) required for aircraft balance.
   - ◯ c. It has no impact on cruise speed.
   - ◯ d. Loading forward is more beneficial for cruise speed.

8. What is the potential impact of large fuel burns and the movement of passengers and flight attendants with beverage carts on CG location?
   - ◯ a. It has no effect on CG location.
   - ◯ b. It can significantly impact CG location between takeoff and landing.
   - ◯ c. CG location remains constant throughout the flight as long as fuel tanks remain balanced.
   - ◯ d. CG location is only influenced by large fuel burns.

9. How do the Airbus A330 and Boeing 787 address CG movement and enhance performance during flight?
   - ◯ a. By adjusting the pitch of the aircraft.
   - ◯ b. Using wing shaping control systems for load and drag optimization.
   - ◯ c. Implementing complex lateral fuel balancing procedures.
   - ◯ d. Allowing automatic deflection of leading-edge flaps.

10. What is a common method used by flight crews to perform quick and accurate weight and balance computations?
    - ◯ a. Manual calculations using actual passenger weights.
    - ◯ b. Random loading programs.
    - ◯ c. Standard average weight for any cargo on board.
    - ◯ d. Long-form weight and balance.

NAME ______________________ DATE ______________

CHAPTER 12
Airplane Handling, Service, and Maintenance

1. What is a major conceptual difference between Part 91 operations and Part 121 or Part 135 operations, according to the FAA?
   - ◯ a. Part 121 and Part 135 require more frequent mechanic sign-offs.
   - ◯ b. Part 91 involves more detailed maintenance and flight records.
   - ◯ c. In Part 121 or Part 135 operations, the FAA wants to know exactly who is in control of planning and operating company aircraft and how that control is exercised.
   - ◯ d. Part 91 emphasizes active control over passive control in operational procedures.

2. What is the term used for the exercise of authority over initiating, conducting, or terminating a flight, as defined by the FAA under 14 CFR §1.1?
   - ◯ a. Flight dispatch or flight following.
   - ◯ b. Operational control.
   - ◯ c. Joint collaborative responsibility.
   - ◯ d. Passive control.

3. What is the shared responsibility of the aircraft dispatcher and the pilot-in-command (PIC)?
   - ◯ a. The aircraft dispatcher is solely responsible for preflight planning, while the PIC handles dispatch release.
   - ◯ b. The PIC is responsible for monitoring the progress of each flight, and the dispatcher has full control and authority during flight time.
   - ◯ c. The PIC and dispatcher share joint responsibility for preflight planning and dispatch release in compliance with the FARs and company operations specifications.
   - ◯ d. The aircraft dispatcher has full control and authority over the aircraft and crew during flight time.

4. What does operational control entail in terms of ensuring crew and aircraft compliance?
   - ◯ a. Monitoring the progress of each flight.
   - ◯ b. Designating a PIC for each flight.
   - ◯ c. Issuing necessary information for the safety of the flight.
   - ◯ d. Ensuring crewmembers are trained and qualified, and specifying conditions for flight release.

5. Which regulatory document is required for commercial operators to explain how they will conduct operations of their aircraft in accordance with the FARs?
   - ◯ a. Training Specs.
   - ◯ b. Letters of Authorization (LOAs).
   - ◯ c. Operations Specifications (Ops Specs).
   - ◯ d. Management Specs (M Specs).

6. What is the purpose of "captain's fuel"?
   - ◯ a. Fuel reserved for use only in emergency situations.
   - ◯ b. Fuel added at the captain's discretion without negotiating with the flight dispatcher.
   - ◯ c. Extra fuel for longer flights.
   - ◯ d. Fuel allocated for extended ground deicing procedures.

7. In larger aircraft, what is typically the responsibility of the first officer (FO) during the preflight process?
   - ◯ a. Reviewing the passenger manifest.
   - ◯ b. Ensuring all required documents are on board the aircraft.
   - ◯ c. Monitoring the progress of each flight.
   - ◯ d. Briefing the crew on the upcoming flight.

8. What is the primary purpose of the Minimum Equipment List (MEL) mentioned in the text?
   - ◯ a. To ensure redundancy in aircraft systems.
   - ◯ b. To track the date and time an item was deferred and subsequently repaired.
   - ◯ c. To allow flights to be conducted with certain inoperative equipment while maintaining airworthiness.
   - ◯ d. To list required onboard documents for preflight.

9. How are inoperative items categorized in the MEL based on their importance and redundancy?
   - ◯ a. Category A and B items are highly redundant, while Category C and D items have little redundancy.
   - ◯ b. Category A and B items are highly redundant, while Category C and D items pose little hazard to flight safety.
   - ◯ c. Equipment with little redundancy and/or critical to the safety of flight are categorized as Category A or B, while equipment associated with highly redundant systems and/or not as critical to safety of flight are categorized as Category C and D.
   - ◯ d. Category A and B items are allowed to be inoperative for longer durations, while Category C and D items have shorter repair intervals.

10. What is the primary purpose of a Configuration Deviation List (CDL) for aircraft?
   - ◯ a. To track the date and time of routine maintenance.
   - ◯ b. To defer inoperative items in the passenger compartment.
   - ◯ c. To specify the required onboard documents for preflight.
   - ◯ d. To allow operation without certain secondary airframe or engine parts while maintaining airworthiness.

11. How does the nonessential equipment and furnishings (NEF) list differ from the MEL and CDL?
    - ◯ a. NEF items must be repaired within 10 consecutive calendar days.
    - ◯ b. NEF items affect certification and operational control rules.
    - ◯ c. NEF items are nonessential and do not impact safety of flight.
    - ◯ d. NEF items are not kept with the MEL in the same notebook format.

12. What is the primary purpose of ground deicing for aircraft?
    - ◯ a. To improve fuel efficiency during flight.
    - ◯ b. To provide extended anti-ice protection on the airframe.
    - ◯ c. To minimize the use of glycol-based fluids.
    - ◯ d. To enhance passenger comfort during taxiing.

13. Which type of deicing fluid is designed to shear off on the takeoff roll at airspeeds between 80 and 100 knots?
    - ◯ a. Type I fluid.
    - ◯ b. Type II fluid.
    - ◯ c. Type IV fluid.
    - ◯ d. All types of fluids shear off at the same airspeed.

14. What is the purpose of the holdover time (HOT) in ground deice/anti-ice procedures?
    - ◯ a. It determines the time needed for the deicing fluid to be applied.
    - ◯ b. It estimates the time the anti-icing fluid will remain effective in preventing frozen contamination.
    - ◯ c. It indicates the time an aircraft can remain on the ground before takeoff.
    - ◯ d. It specifies the time required for post-deicing visual checks.

15. Why is the clean aircraft concept important in ground deicing procedures?
    - ◯ a. It ensures passengers have a clear view during takeoff.
    - ◯ b. It prevents contamination that may reduce lift and increase drag.
    - ◯ c. It reduces the need for deicing fluids.
    - ◯ d. It improves the aircraft's aesthetic appearance.

16. What characterizes the one-step process for applying deicing and anti-icing fluids?
    - ◯ a. It utilizes only Type IV fluid for both deicing and anti-icing.
    - ◯ b. It involves separate applications of thickened fluid for deicing and anti-icing.
    - ◯ c. It applies a heated mixture of thickened fluid and water in a single step for both deicing and anti-icing.
    - ◯ d. It uses a two-step procedure with different fluids for deicing and anti-icing.

17. What are the two types of holdover time (HOT) tables mentioned in the text?

- ◯ a. Generic and brand name specific.
- ◯ b. One-step table and two-step table.
- ◯ c. Weather and visibility.
- ◯ d. Short and long.

18. HOT times vary with weather conditions. How is the effectiveness of deicing/anti-icing fluids influenced?

- ◯ a. Primarily by the type of aircraft.
- ◯ b. By the airport location.
- ◯ c. By the temperature, precipitation type, wind, and aircraft skin temperature.
- ◯ d. By the time of day.

19. What is the purpose of a pre-takeoff check mentioned in the text?

- ◯ a. To confirm the aircraft's takeoff clearance.
- ◯ b. To inspect the aircraft for ice, snow, or frost formation.
- ◯ c. To verify the runway length for takeoff.
- ◯ d. To perform a last-minute fuel check.

20. How are taxi route instructions simplified and communicated at major airports?

- ◯ a. By using Unicom radio frequencies.
- ◯ b. By writing down all instructions.
- ◯ c. By ATC issuing coded taxi routes.
- ◯ d. By visual signals from ground personnel.

NAME ______________________ DATE ______________

CHAPTER 13

Navigation, Communication, and Electronic Flight Control Systems

1. What does a flight director do in comparison to an autopilot?
   - ◯ a. Operates flight controls automatically.
   - ◯ b. Provides guidance for precise hand-flying but cannot control the aircraft.
   - ◯ c. Automatically captures and flies ILS approaches.
   - ◯ d. Monitors autopilot operation through command bars.

2. Which system is responsible for automatically operating flight controls to fly the airplane, including maintaining altitude, holding a selected heading, and tracking navigational courses?
   - ◯ a. Horizontal situation indicator (HSI).
   - ◯ b. Flight director.
   - ◯ c. Electronic flight instrumentation system (EFIS).
   - ◯ d. Autopilot.

3. What is the advantage of electronic flight instrumentation systems (EFIS) over older-style analog electromechanical instruments?
   - ◯ a. EFIS can control the aircraft automatically.
   - ◯ b. EFIS provides information on engine parameters.
   - ◯ c. EFIS allows for flexible information display and presents a variety of additional useful information.
   - ◯ d. EFIS is less challenging for pilots to learn.

4. What is the primary function of the flight mode annunciator (FMA) in aircraft equipped with glass cockpits?
   - ◯ a. Displays engine and systems information.
   - ◯ b. Provides information for precise hand-flying.
   - ◯ c. Indicates the current operational modes for the flight director, autopilot, and autothrust system.
   - ◯ d. Presents a head-up display (HUD) for instrument approaches.

5. What are the main advantages of an attitude and heading reference system (AHRS) over an inertial reference system (IRS)?
   - ◯ a. AHRS provides flight director navigation capability, while IRS provides only reference information.
   - ◯ b. AHRS system is smaller, lighter, more reliable, and requires less electrical power to operate.
   - ◯ c. AHRS is larger and heavier than IRS.
   - ◯ d. IRS is a combination of advanced attitude and heading inertial sensors.

6. What is the primary value of head-up displays (HUDs) in aircraft?
   - ◯ a. Allows pilots to fly the aircraft automatically.
   - ◯ b. Provides information for precise hand-flying.
   - ◯ c. Integrates windshear, TCAS traffic alert warnings, and enhanced ground proximity warning systems.
   - ◯ d. Allows pilots to shoot an instrument approach while looking out the forward window.

7. What does RNAV (area navigation) equipment offer pilots in terms of navigational flexibility?
   - ◯ a. Ability to fly directly from departure airport to destination airport.
   - ◯ b. Relieves enroute traffic congestion.
   - ◯ c. RNAV only allows flight from one ground-based NAVAID to another ground-based NAVAID such as a VOR.
   - ◯ d. Both A and B.

8. What is the main advantage of the Global Positioning System (GPS) over ground-based navigation systems?
   - ◯ a. GPS requires fewer satellites for operation.
   - ◯ b. GPS provides navigation without the need for ground-based nav stations.
   - ◯ c. GPS relies on inertial sensors for precise navigation.
   - ◯ d. GPS is limited to enroute navigation only.

9. How does a Global Navigation Satellite System (GNSS) differ from GPS?
   - ◯ a. GNSS is limited to signals from the GPS constellation.
   - ◯ b. GNSS can use signals from multiple satellite systems, including GPS, GLONASS, Galileo, and Beidou.
   - ◯ c. GNSS relies on ground-based nav stations for operation.
   - ◯ d. GNSS is primarily used for precision approaches.

10. What is the main advantage of the inertial navigation system (INS) over other navigational systems?
   - ◯ a. INS is less susceptible to interference from weather and electronic jamming.
   - ◯ b. INS requires external navigational signals for operation.
   - ◯ c. INS accumulates fewer position errors over time.
   - ◯ d. INS is primarily used for enroute navigation.

11. In RNP airspace, what does the actual navigation performance (ANP) represent, and how does it relate to the required navigation performance (RNP)?

- ◯ a. ANP indicates the aircraft's position accuracy, and it should always be greater than RNP to trigger a warning.
- ◯ b. ANP represents the confidence level of the navigation system in determining the aircraft's position, and it should always be less than RNP.
- ◯ c. ANP is the minimum required navigation accuracy, and it is independent of the RNP value.
- ◯ d. ANP is a measure of altitude precision during an approach, and it is compared to the RNP for vertical navigation.

12. What is the purpose of receiver autonomous integrity monitoring (RAIM) in GPS navigation?

- ◯ a. RAIM continuously checks the integrity and performance of GPS signals.
- ◯ b. RAIM provides satellite coverage predictions during preflight planning.
- ◯ c. RAIM determines the quality of ADF signals during flight.
- ◯ d. RAIM performs consistency checks among LORAN signals.

13. What does a predictive RAIM (PRAIM) check determine during preflight planning?

- ◯ a. The quality of GPS signals during the flight.
- ◯ b. The consistency of GPS signals from multiple GNSS satellite systems.
- ◯ c. The availability of satellite coverage at the planned time of arrival.
- ◯ d. The difference between required navigation performance (RNP) versus actual navigation performance (ANP).

14. What is the primary purpose of Differential Global Positioning Systems (DGPS)?

- ◯ a. To provide weather information to GPS receivers.
- ◯ b. To improve the accuracy of GPS signals by using ground-based reference receivers.
- ◯ c. To transmit correction messages to traditional navigation systems.
- ◯ d. To provide a triple-mix of GPS, ADF, and VOR navigational signals that can be used for precision approaches.

15. Which are examples of Differential Global Positioning Systems (DGPS)?

- ◯ a. Wide Area Augmentation System (WAAS) and Ground-Based Augmentation System (GBAS).
- ◯ b. RNP versus ANP navigational performance differential.
- ◯ c. RAIM versus PRAIM navigational performance differential.
- ◯ d. LNAV with VNAV navigational performance capability.

16. Which of the following is a characteristic of Localizer Performance with Vertical Guidance (LPV) approaches?
    - ◯ a. They provide lateral guidance and do not provide vertical guidance.
    - ◯ b. Their lateral and vertical deviations are nearly identical to traditional ILS approaches.
    - ◯ c. They use satellite signals as pseudo reference stations.
    - ◯ d. They have a minimum descent altitude (MDA) instead of a decision altitude (DA).

17. What does advisory-only vertical guidance provide during a non-precision LNAV or LP approach?
    - ◯ a. It lowers the published minimum descent altitude (MDA) to a pseudo decision altitude (DA).
    - ◯ b. It helps maintain a stabilized final approach but does not lower the published minimum descent altitude.
    - ◯ c. It replaces the need for ground-based navigation aids.
    - ◯ d. It is used for automatic position analyzation to establish higher approach minimums.

18. What is the purpose of the flight management system (FMS) multifunction control display unit (MCDU)?
    - ◯ a. To display master warning and master caution messages concerning system malfunctions.
    - ◯ b. To provide lateral guidance to the runway on a heads-up device (HUD).
    - ◯ c. To allow the pilot to interact with the FMS computer by inputting navigation, performance, and other data.
    - ◯ d. To generate correction messages for DGPS receivers.

19. What is the purpose of the aircraft "identification page" during the FMS preflight?
    - ◯ a. To calculate takeoff V-speeds.
    - ◯ b. To display command markers for airspeed and thrust targets.
    - ◯ c. To check the validity and currency of the installed navigation database and aircraft information.
    - ◯ d. To alter previously entered settings for enroute changes.

20. What is the primary role of ACARS (aircraft communications addressing and reporting system) in flight operations?
    - ◯ a. To provide selective-calling VHF or HF radio monitoring.
    - ◯ b. To transmit winds-aloft and turbulence information to ground stations for weather forecasting.
    - ◯ c. To continuously update the aircraft's position and direct controls during flight.
    - ◯ d. To alert pilots of incoming communications and transmit various flight information to the company.

21. What is the primary purpose of SELCAL in aviation?
- ◯ a. To monitor engine performance.
- ◯ b. To alert pilots of incoming VHF or HF communications.
- ◯ c. To control enroute air traffic flow.
- ◯ d. To provide in-flight wind, turbulence, and weather report updates.

22. What is the main benefit of the Flight Operational Quality Assurance (FOQA) program?
- ◯ a. Improving in-flight weather reporting systems.
- ◯ b. Enhancing flight efficiency and preventing accidents.
- ◯ c. Reducing fuel consumption.
- ◯ d. Reducing cabin noise caused by engine vibration.

23. What problem does Controller-Pilot Data-Link Communications (CPDLC) aim to address?
- ◯ a. Displays flight information to ATC if primary radar is unavailable.
- ◯ b. Frequency congestion in voice communications.
- ◯ c. Lack of accurate weather information on long flights.
- ◯ d. Provides controllers with aircraft performance data.

24. Which type of surveillance does Automatic Dependent Surveillance–Broadcast (ADS-B) use?
- ◯ a. Primary or secondary radar-based surveillance.
- ◯ b. Sonar-based surveillance.
- ◯ c. Transponder-based surveillance.
- ◯ d. Camera-based surveillance.

25. In the context of aviation automation, what does Level One refer to?
- ◯ a. Fully automated flight with autopilot and auto-thrust control.
- ◯ b. Manual "stick and rudder" flying without any automation.
- ◯ c. Standard operations with twist knobs and pushbuttons for control.
- ◯ d. Hand-flying with the guidance of flight director commands.

NAME ____________________ DATE ____________________

CHAPTER 14
Hazard Avoidance Systems

1. What does the FAA require for large transport category aircraft engaged in passenger-carrying operations?
   - ◯ a. Carry a lightning detector only.
   - ◯ b. Be equipped with airborne weather radar.
   - ◯ c. Have both lightning detector and weather radar.
   - ◯ d. Be equipped with live satellite TV in order to watch the Weather Channel.

2. What is the primary use of radar in civil aircraft?
   - ◯ a. Terrain avoidance.
   - ◯ b. Navigation support.
   - ◯ c. Thunderstorm detection and avoidance.
   - ◯ d. Communication with air traffic control.

3. What is the purpose of azimuth scan in radar systems?
   - ◯ a. To measure distance to targets.
   - ◯ b. To cover more area with the radar beam.
   - ◯ c. To adjust antenna tilt up and down.
   - ◯ d. To select radar intensity levels.

4. How is radar range calculated?
   - ◯ a. By measuring the RF signal's travel time between the target and back.
   - ◯ b. By adjusting antenna tilt.
   - ◯ c. By using azimuth scan.
   - ◯ d. By selecting distance scales.

5. What does radar attenuation refer to?
   - ◯ a. Weakening of RF signals due to the Doppler effect.
   - ◯ b. Absorption of RF signals by heavy precipitation.
   - ◯ c. Increased radar reflection above the freezing level of a thunderstorm.
   - ◯ d. Decrease in radar sensitivity due to extreme height of some radar echo tops.

6. What does a radar shadow indicate?
   - ◯ a. A blackout of data behind a weather cell.
   - ◯ b. A region of clear weather.
   - ◯ c. A temporary radar malfunction.
   - ◯ d. Steep precipitation gradient found in most echo tops.

7. What is the purpose of Doppler radar in newer generation radar systems?
   - ◯ a. To measure precipitation intensity.
   - ◯ b. To detect lightning.
   - ◯ c. To analyze frequency changes in reflected echoes to identify storm-related turbulence.
   - ◯ d. To estimate echo tops.

8. What is the primary function of electrical discharge detectors, or lightning detectors?
   - ◯ a. Weather satellite detection and communication.
   - ◯ b. Thunderstorm detection.
   - ◯ c. Precipitation intensity analysis.
   - ◯ d. Terrain avoidance.

9. What is a fundamental difference between electrical discharge detectors (lightning detectors) and weather radar?
   - ◯ a. Lightning detectors use radio receivers to sense electrical discharges, while radar actively transmits signals for precipitation detection.
   - ◯ b. Lightning detectors are limited to a ±60-degree sensing range, while radar can provide a 360-degree view relative to the aircraft.
   - ◯ c. Radar accumulates symbols for lightning strokes, while lightning detectors display precipitation rates and areas of turbulence.
   - ◯ d. Lightning detectors are installed primarily in larger aircraft, while radar is more common in lighter general aviation aircraft.

10. What advantage do electrical discharge detectors have over weather radar in sensing weather around the aircraft?
    - ◯ a. Radar has a limited sensing azimuth range, while electrical discharge detectors can show 360 degrees of weather.
    - ◯ b. Radar provides more accurate distance measurements than electrical discharge detectors.
    - ◯ c. Radar is less affected by attenuation compared to electrical discharge detectors.
    - ◯ d. Electrical discharge detectors have moving parts, unlike radar.

11. What is the primary function of the traffic alert and collision avoidance system (TCAS)?
    - ◯ a. Detecting precipitation.
    - ◯ b. Detecting and providing terrain warnings.
    - ◯ c. Detecting nearby air traffic conflicts and avoiding midair collisions.
    - ◯ d. Displaying areas of air traffic delays to be avoided.

12. What warning does the TCAS issue if a traffic conflict is detected?
    - ◯ a. "Aircraft in your path, aircraft in your path."
    - ◯ b. "Pull up, avoid aircraft ahead."
    - ◯ c. "Aircraft ahead, aircraft ahead."
    - ◯ d. "Traffic, traffic."

13. How does a reactive wind-shear warning system (RWS) differ from a predictive wind-shear warning system (PWS)?
    - ◯ a. RWS warns upon entering wind shear, while PWS warns of wind shear ahead of the aircraft.
    - ◯ b. RWS uses radar, while PWS detects wind shear using the GPWS.
    - ◯ c. RWS provides visual depiction on the HSI or NAV display, while PWS provides aural warnings.
    - ◯ d. PWS detects wind shear by monitoring aircraft inertial and aerodynamic data.

14. What is the purpose of flight envelope protection systems?
    - ◯ a. To enhance the G-load capability of the aircraft.
    - ◯ b. To prevent pilots from exceeding programmed limits.
    - ◯ c. To improve fuel efficiency.
    - ◯ d. To monitor air traffic.

15. According to Advisory Circular (AC) 120-109A, what cautionary note does the FAA provide regarding aircraft equipped with flight envelope protection systems?
    - ◯ a. Envelope-protected airplanes demonstrate zero stall accidents.
    - ◯ b. Loss-of-control incidents are nonexistent in aircraft with protection systems.
    - ◯ c. Flight crews may experience difficulty recovering after multiple system failures.
    - ◯ d. Stall prevention and recovery training is unnecessary for protected aircraft.

NAME ______________________ DATE ______________

CHAPTER 15
Operational Information

1. What is the purpose of high-altitude training for pilots flying pressurized aircraft at or above FL250?
   - ◯ a. Enhance navigation skills.
   - ◯ b. Improve communication with air traffic control.
   - ◯ c. Learn about safe flight in high-altitude operations.
   - ◯ d. Practice emergency landings at high altitudes.

2. Calibrated airspeed (CAS) is:
   - ◯ a. The speed shown on the airspeed indicator.
   - ◯ b. Indicated airspeed corrected for instrument and installation error.
   - ◯ c. Indicated airspeed corrected for altitude and nonstandard temperatures.
   - ◯ d. Ground speed adjusted for wind.

3. True airspeed (TAS) is:
   - ◯ a. The speed shown on the airspeed indicator.
   - ◯ b. Indicated airspeed corrected for altitude and nonstandard temperature.
   - ◯ c. Equal to calibrated airspeed (CAS).
   - ◯ d. Ground speed adjusted for wind.

4. What does Mach number indicate in high-speed aircraft?
   - ◯ a. The difference between true airspeed and ground speed.
   - ◯ b. True airspeed.
   - ◯ c. Ratio of the aircraft's airspeed to the speed of sound.
   - ◯ d. Indicated airspeed corrected for non-standard calibrated airspeed.

5. In transonic flight, what characterizes the airflow over the aircraft's surfaces?
   - ◯ a. Subsonic airflow.
   - ◯ b. Supersonic airflow.
   - ◯ c. Mixed airflow below and above the speed of sound.
   - ◯ d. Stall-induced airflow.

6. What is the crossover altitude in high-altitude flight?
   - ◯ a. Indicates the transition to RVSM altitude operations.
   - ◯ b. The altitude at which indicated airspeed (IAS) and Mach value coincide at the same true airspeed (TAS).
   - ◯ c. Marks the start of supersonic flight.
   - ◯ d. Defines the maximum operating altitude.

7. What is Mach tuck?
   - ◯ a. A phenomenon where the indicated airspeed (IAS) and Mach value coincide at the same true airspeed (TAS), producing a noticeable pitch-down tendency.
   - ◯ b. An aircraft's pitch-down tendency due to the aft movement of the center of pressure at higher-than-designed Mach numbers.
   - ◯ c. A high-speed maneuvering technique used at high altitudes to avoid exceeding M_{MO} airspeed.
   - ◯ d. An aircraft's pitch-down tendency when flying at an airspeed where M_{MO} equals the stall speed.

8. What is the critical Mach number (Mach Crit)?
   - ◯ a. The highest Mach number an aircraft can possibly travel in level flight.
   - ◯ b. The speed at which airflow becomes supersonic over the wing.
   - ◯ c. The maximum operating speed relative to the speed of sound.
   - ◯ d. The Mach speed (M_{MO}) limitation for a specific aircraft.

9. What is the "coffin corner" in high-altitude flight?
   - ◯ a. An altitude where the crossover altitude and transition altitude are the same.
   - ◯ b. The point where stall speed approaches the limiting Mach number (M_{MO}).
   - ◯ c. An area with high turbulence levels.
   - ◯ d. A specific altitude for optimal fuel efficiency.

10. As an aircraft climbs, why does the angle of attack (AOA) need to be increased to maintain the same coefficient of lift?
    - ◯ a. To reduce lift and prevent Mach tuck.
    - ◯ b. Due to decreased air density.
    - ◯ c. To move the wings' angle of coincidence.
    - ◯ d. To maintain the same altitude.

11. At high altitude, why does stall speed increase while the indicated airspeed (IAS) decreases?
    - ◯ a. Increased air density.
    - ◯ b. Reduced air density.
    - ◯ c. Higher coefficient of lift.
    - ◯ d. Lower Mach numbers.

12. What effect does G-loading have on an aircraft's angle of attack (AOA) and buffet speeds during maneuvering at high altitude?
    - ◯ a. Decreases AOA, increases stall buffet speeds.
    - ◯ b. Increases AOA, decreases stall buffet speeds.
    - ◯ c. Increases AOA, increases stall buffet speeds.
    - ◯ d. Decreases AOA, decreases stall buffet speeds.

13. How does an increase in aircraft weight affect its altitude capability?
   - ◯ a. Increases altitude capability.
   - ◯ b. Decreases altitude capability.
   - ◯ c. No impact on altitude capability.
   - ◯ d. Reduces stall speed while increasing the limiting Mach number (M_{MO}).

14. What is the purpose of laminar-flow wings in aircraft design?
   - ◯ a. Increase lift.
   - ◯ b. Decrease cruise speed.
   - ◯ c. Minimize drag.
   - ◯ d. Enhance maneuverability.

15. Why do swept-wing aircraft require retractable lift-enhancing devices for slower airspeeds?
   - ◯ a. To decrease drag.
   - ◯ b. To decrease lateral stability.
   - ◯ c. To minimize longitudinal stability.
   - ◯ d. To increase lift at slow airspeeds required for takeoff and landing.

16. What is a Dutch roll?
   - ◯ a. A type of aerobatic maneuver first flown in Holland.
   - ◯ b. A tendency of aircraft to roll when yawing.
   - ◯ c. A type of turbulence during descent.
   - ◯ d. A maneuver to counteract turbulence.

17. How does a yaw damper help mitigate Dutch roll?
   - ◯ a. By increasing yawing tendencies.
   - ◯ b. By reducing turbulence effects.
   - ◯ c. By promoting sideslip during yawing.
   - ◯ d. By automatically countering yaw with control inputs.

18. What is the main purpose of winglets on high-speed aircraft?
   - ◯ a. To increase drag.
   - ◯ b. To enhance effective span and lift.
   - ◯ c. To improve lateral stability.
   - ◯ d. To counteract Dutch roll.

19. What is the purpose of vortex generators on an aircraft?
   - ◯ a. To create increased stall speeds at higher altitudes.
   - ◯ b. To reduce lift at high AOA.
   - ◯ c. To direct airflow into the wings' boundary layer.
   - ◯ d. To increase drag during approach and landing.

20. What is the FAA's definition of runway visual range (RVR)?
   - ◯ a. The distance between runways at an airport.
   - ◯ b. The horizontal distance a pilot can expect to see down the runway.
   - ◯ c. The number of runway lights on a specific runway.
   - ◯ d. The distance from the airport to the nearest enroute alternate airport.

21. How is RVR measured?
   - ◯ a. By human observers.
   - ◯ b. Using a transmissometer light projector and receiver system.
   - ◯ c. Through visual contrast of other targets only.
   - ◯ d. By the intensity of runway lights.

22. What is the purpose of a Surface Movement Guidance and Control System (SMGCS) during low-visibility operations?
   - ◯ a. To automatically provide control and separation from taxiing aircraft on the ground.
   - ◯ b. To provide aircraft with automatic steering information during takeoff in low-visibility conditions.
   - ◯ c. To prevent collisions on the airport surface.
   - ◯ d. To enhance communication between pilots and ATC.

23. What is the purpose of a takeoff alternate?
   - ◯ a. To provide an alternate destination for the flight.
   - ◯ b. To ensure the aircraft has enough fuel for takeoff.
   - ◯ c. To comply with regulations when weather conditions prevent return to the departure airport.
   - ◯ d. To determine the maximum takeoff weight of the aircraft.

24. How is flight time to the takeoff alternate regulated for a typical twin-engine, transport category, turbine-powered aircraft?
   - ◯ a. Within two hours flying time.
   - ◯ b. Within one hour flying time.
   - ◯ c. Within three hours flying time.
   - ◯ d. Within four hours flying time.

25. What are the standard takeoff visibility minimums established by the FAA for single- or twin-engine aircraft?
   - ◯ a. 2 SM visibility
   - ◯ b. 1 SM visibility
   - ◯ c. 1/2 SM visibility
   - ◯ d. 3 SM visibility

26. What is the minimum allowable RVR for most commercially operated aircraft during takeoff?
    - ◯ a. 1,000 feet
    - ◯ b. 800 feet
    - ◯ c. 600 feet
    - ◯ d. 500 feet

27. What is the purpose of Extended Range Twin-Engine Operations (ETOPS) certification?
    - ◯ a. To limit the range of twin-engine airplanes to 60 minutes from an alternate airport.
    - ◯ b. To allow twin-engine airplanes to operate for typically 180 minutes from the nearest enroute alternate airport.
    - ◯ c. To require three- or four-engine aircraft to fly more direct routes.
    - ◯ d. To restrict the operation of twin-engine airplanes to specific airspaces.

28. Which altitude setting is used when operating in the flight levels?
    - ◯ a. QNE
    - ◯ b. QNH
    - ◯ c. QFE
    - ◯ d. QDM or QDR

29. What is the purpose of the Strategic Lateral Offset Procedure (SLOP)?
    - ◯ a. To increase collision risk on published jet routes.
    - ◯ b. To decrease wake turbulence hazards during takeoff.
    - ◯ c. To reduce collision risk on published jet routes for same and opposite direction traffic.
    - ◯ d. To limit the lateral offset to the left of route centerline.

30. What is the primary cause of wake turbulence, and where does it originate?
    - ◯ a. Engine failure during takeoff.
    - ◯ b. The use of speed brakes from aircraft on approach.
    - ◯ c. Wing tip vortices created by the pressure differential during lift generation.
    - ◯ d. Lack of aircraft winglets.

NAME ____________________ DATE ____________________

CHAPTER 16
Weather Considerations for Turbine Pilots

1. What is the main concern for pilots regarding low-altitude weather?
   - ◯ a. Cloud formations.
   - ◯ b. Wind shear and microbursts.
   - ◯ c. High humidity during the summer months.
   - ◯ d. Temperature fluctuations.

2. Why are microbursts particularly dangerous for large turbojet aircraft?
   - ◯ a. They cause turbulence in the atmosphere.
   - ◯ b. They are associated with thunderstorms.
   - ◯ c. Large aircraft mass and long engine spool-up time make recovery difficult.
   - ◯ d. They only occur in desert and high plains areas.

3. What is the recommended action for pilots encountering wind shear?
   - ◯ a. Decrease pitch attitude.
   - ◯ b. Maintain current flap and gear configuration.
   - ◯ c. Apply maximum power and increase pitch attitude.
   - ◯ d. Ignore the wind shear alert and continue normal operations.

4. What does the term "rime ice" refer to?
   - ◯ a. Transparent ice formed at high altitudes.
   - ◯ b. Granular and opaque ice formed in stratified clouds.
   - ◯ c. Clear ice formed in cumulus clouds.
   - ◯ d. Ice formed due to freezing rain.

5. When does clear ice most often form?
   - ◯ a. During warm temperatures in humid conditions.
   - ◯ b. When in areas of high atmospheric pressure.
   - ◯ c. In areas of falling rain or when encountering recirculated droplets in cumuliform clouds.
   - ◯ d. When the aircraft is equipped with the latest ice protection equipment.

6. What is the effect of ice accumulation on an aircraft wing?
   - ◯ a. Increases lift and decreases drag.
   - ◯ b. Decreases weight and increases thrust.
   - ◯ c. Reduces lift, increases drag, and causes controllability problems.
   - ◯ d. Improves the overall aerodynamics of the wing.

7. What information does cloud type provide in relation to icing threat?
   - ◯ a. Air mass temperature.
   - ◯ b. Atmospheric moisture content.
   - ◯ c. Temperature of the air mass.
   - ◯ d. Severity of icing threat.

8. In which cloud type is airframe icing rarely an issue, unless associated with the anvil tops of cumulonimbus clouds?
   - ◯ a. Cumulus clouds.
   - ◯ b. Stratus clouds.
   - ◯ c. Cirrus clouds.
   - ◯ d. Altostratus clouds.

9. What is the purpose of turbine-engine auto-recovery systems in icing conditions?
   - ◯ a. To enhance fuel efficiency.
   - ◯ b. To prevent propeller icing.
   - ◯ c. To recover engine power after flameout or stall.
   - ◯ d. To assist in recovery of a turbine engine if it is ever lost or stolen.

10. What is the recommended action when encountering ice-induced aileron reversal?
    - ◯ a. Increase airspeed.
    - ◯ b. Engage autopilot.
    - ◯ c. Reduce flap settings.
    - ◯ d. Disengage autopilot and exit icing conditions.

11. What should pilots consider when encountering tailplane stall conditions during final approach?
    - ◯ a. Immediately extend flaps to full flap setting.
    - ◯ b. Reduce power setting to idle to prevent engine ice ingestion damage.
    - ◯ c. Retract the flaps back to their previous position.
    - ◯ d. Recovery is always possible in tailplane stalls.

12. What is emphasized in FAA AC 91-74B regarding aircraft certified for known icing conditions?
    - ◯ a. Relaxed vigilance is acceptable after effectively coping with icing conditions.
    - ◯ b. Severe icing encounters should be avoided even in approved aircraft.
    - ◯ c. Freezing rain and drizzle are within FAA certification requirements.
    - ◯ d. The use of flaps is recommended in severe icing conditions.

13. What is a recommended strategy for avoiding clear air turbulence (CAT) during flight?
    - ◯ a. Maintain high-speed cruise at all times in order to bust through the turbulence in minimum time.
    - ◯ b. Pay attention to the weather application turbulence display on your EFB tablet, slow down before entering, and exit as soon as possible.
    - ◯ c. Ignore wind direction and temperature changes when entering turbulent areas.
    - ◯ d. Rely solely on preflight planning to avoid CAT.

14. In what altitude range does the jet stream typically occur?
    - ◯ a. Below 10,000 feet.
    - ◯ b. 10,000 to 20,000 feet.
    - ◯ c. 25,000 to 35,000 feet.
    - ◯ d. Above 40,000 feet.

15. How can pilots optimize ground speed and fuel consumption when flying in the same general direction as the jet stream?
    - ◯ a. Fly at lower altitudes where winds are less strong.
    - ◯ b. Fly perpendicularly through the jet stream core for maximum speed.
    - ◯ c. Choose routes well north or south of the direct course if required to remain in the jet stream.
    - ◯ d. Avoid the jet stream entirely to reduce fuel consumption.

16. What is a potential hazard of clear air turbulence (CAT)?
    - ◯ a. Increased likelihood of engine failure.
    - ◯ b. Structural damage or failure, and possible injury for flight attendants and passengers.
    - ◯ c. Interference with onboard GPS signal reception.
    - ◯ d. Increased possibility of engine ice ingestion.

17. What external cues are important for taxiing larger, turbine-powered aircraft in crosswind conditions?
    - ◯ a. Windsock, flags mounted on top of the terminal, and the movement of trees.
    - ◯ b. ATIS reports, local weather reports, and runway lights.
    - ◯ c. Cloud formations, ground speed indicators, and radio communications.
    - ◯ d. Aircraft weight, engine power, and air traffic control instructions.

18. During a crosswind takeoff, why is it important to keep the main wheels on the ground slightly longer than usual?
    - ◯ a. To reduce fuel consumption.
    - ◯ b. To avoid damage to the tires.
    - ◯ c. To transition from rotation to lift-off with more positive control.
    - ◯ d. To enhance safety for flight attendants and passengers.

19. What is the preferred crosswind landing technique for certain fly-by-wire aircraft?
   - ◯ a. Crab method.
   - ◯ b. Wing-low method.
   - ◯ c. Combination of both methods.
   - ◯ d. Nose-wheel first touchdown method.

20. How does the Runway Condition Assessment Matrix (RCAM) help pilots during landing operations?
   - ◯ a. It provides information on the wind direction and intensity.
   - ◯ b. It assesses the runway surface condition for braking action.
   - ◯ c. It determines the maximum crosswind component for takeoff.
   - ◯ d. It offers guidelines for flap settings during crosswind landings.

21. What is the FAA's definition of aircraft turbulence?
   - ◯ a. Regular motion of an aircraft around the longitudinal axis.
   - ◯ b. Irregular motion of an aircraft in flight due to rapid changes in wind velocities.
   - ◯ c. Rapid acceleration of an aircraft during takeoff.
   - ◯ d. Stable motion of an aircraft in flight.

22. What creates convective turbulence?
   - ◯ a. Mechanical obstructions.
   - ◯ b. Wind shear.
   - ◯ c. Updrafts from heated air.
   - ◯ d. Wake turbulence from other aircraft.

23. Which type of turbulence results when an aircraft passes through turbulent airflow created by an aircraft in front of it?
   - ◯ a. Mechanical turbulence.
   - ◯ b. Wake turbulence.
   - ◯ c. Wind shear turbulence.
   - ◯ d. Convective turbulence.

24. What are some mitigating strategies when encountering in-flight turbulence?
   - ◯ a. Seat belt signs should be illuminated when turbulence is anticipated or encountered.
   - ◯ b. Avoid areas near convective weather.
   - ◯ c. Slow aircraft to turbulent air penetration speed.
   - ◯ d. All of the above.

25. What is a key advantage of data-linked weather products?

- ◯ a. They are available only to Part 121 and Part 135 air carriers.
- ◯ b. They rely on hours-old information for accurate decision-making.
- ◯ c. They deliver regularly updated textual and graphical weather during flight.
- ◯ d. They are primarily used by Part 91 pilots for in-flight weather information.