

Aviation History: Scientific Milestones

Aviation History · Practice Test · 25 Questions

1. Which force in aerodynamics acts perpendicular to the direction of motion and is generated primarily by the pressure differential across an airfoil?

- A) Drag
- B) Thrust
- C) Lift
- D) Weight

2. What is the primary scientific function of a wing's dihedral angle?

- A) Increasing structural stiffness
- B) Enhancing lateral stability
- C) Reducing wave drag
- D) Improving fuel efficiency

3. Who formulated the 'Law of Circulation' that explains the relationship between lift and circulation around an airfoil?

- A) Daniel Bernoulli
- B) Ludwig Prandtl
- C) Frederick Lanchester
- D) Nikolai Zhukovsky

4. In the history of jet propulsion, what was the primary innovation of the Whittle engine compared to reciprocating engines?

- A) Use of liquid hydrogen
- B) Centrifugal compression
- C) Pistonless combustion
- D) Solid fuel thrust

5. What phenomenon occurs when a fluid's velocity increases and its static pressure decreases, a principle vital to wing lift?

- A) Venturi effect
- B) Bernoulli's principle
- C) Reynolds number impact
- D) Boundary layer separation

6. The 'Sound Barrier' is officially breached when an aircraft exceeds what specific condition?

- A) The speed of light
- B) The speed of sound in the surrounding medium
- C) Mach 2.0 exactly
- D) The Kármán line

7. What is the purpose of 'winglets' on modern commercial aircraft?

- A) To increase maximum takeoff weight
- B) To reduce induced drag caused by wingtip vortices
- C) To improve pilot visibility
- D) To dampen structural vibrations

8. Which engine component is responsible for increasing the pressure of intake air before it reaches the combustion chamber in a turbojet?

- A) Exhaust nozzle
- B) Compressor
- C) Turbine
- D) Afterburner

9. The 1903 Wright Flyer utilized what method to achieve lateral control (roll)?

- A) Ailerons
- B) Wing warping
- C) Differential thrust
- D) Tail rudders

10. What does the 'Reynolds Number' quantify in aerodynamics?

- A) The ratio of inertial forces to viscous forces
- B) The maximum velocity of an aircraft
- C) The density of air at high altitudes
- D) The lift-to-drag ratio

11. What is the term for the angle between the chord line of the wing and the oncoming relative wind?

- A) Angle of bank
- B) Angle of attack
- C) Angle of incidence
- D) Pitch angle

12. Which aircraft was the first to fly non-stop across the Atlantic Ocean in 1919?

- A) Spirit of St. Louis
- B) Vickers Vimy
- C) Douglas World Cruiser
- D) Curtiss NC-4

13. What is the function of an afterburner in a turbojet engine?

- A) To cool the intake air
- B) To inject fuel into the exhaust stream for extra thrust
- C) To replace the compressor
- D) To reverse the airflow for braking

14. What type of wing configuration helps delay the onset of wave drag at transonic speeds?

- A) Swept wing
- B) Rectangular wing
- C) Elliptical wing
- D) Constant chord wing

15. Which material, extensively used in modern aerospace, is valued for its high strength-to-weight ratio?

- A) Cast iron
- B) Carbon fiber reinforced polymer
- C) Hardwood
- D) Lead alloy

16. What is the primary cause of 'stall' in a fixed-wing aircraft?

- A) Engine failure
- B) Excessive speed
- C) Flow separation over the wing
- D) Loss of electrical power

17. Who is credited with the first powered flight of a heavier-than-air aircraft?

- A) Samuel Langley
- B) The Wright Brothers
- C) Alberto Santos-Dumont
- D) Louis Blériot

18. What measurement unit describes the ratio of the speed of an object to the speed of sound?

- A) Knot
- B) Mach number
- C) Froude number
- D) Reynolds number

19. What is the main role of the 'empennage' on an aircraft?

- A) Providing fuel storage
- B) Increasing lift
- C) Providing stability and control
- D) Protecting the engine

20. Which law of motion explains how a jet engine produces thrust?

- A) Newton's First Law
- B) Newton's Second Law
- C) Newton's Third Law
- D) The Law of Universal Gravitation

21. What is the 'Kármán line' in aviation and space science?

- A) The speed of sound
- B) The boundary between Earth's atmosphere and space
- C) The maximum altitude of a propeller plane
- D) The point where drag equals lift

22. What was the first mass-produced jet-powered fighter aircraft to see operational service?

- A) Gloster Meteor
- B) Messerschmitt Me 262
- C) Lockheed P-80 Shooting Star
- D) Heinkel He 178

23. What is 'parasite drag' in aircraft design?

- A) Drag caused by lift generation
- B) Drag caused by friction and form
- C) Drag caused by shockwaves
- D) Drag caused by wingtip vortices

24. In propeller design, what does 'pitch' refer to?

- A) The angle of the blades
- B) The distance a propeller moves forward in one revolution
- C) The weight of the blades
- D) The rotational speed of the engine

25. Which flight instrument measures the altitude of an aircraft based on atmospheric pressure?

- A) Airspeed indicator
- B) Altimeter
- C) Turn coordinator
- D) Variometer