# The Aerothermodynamics of Artemis II Reentry

Aerospace Engineering · Practice Test · 12 Questions

**1. What is the region between the shock wave and the capsule surface called?**

A) The boundary layer
B) The shock layer
C) The plasma film
D) The stagnation zone

**2. Which equations are used to derive shock jump relations for normal shock waves?**

A) Navier-Stokes Equations
B) Bernoulli's Equations
C) Rankine-Hugoniot Equations
D) Maxwell's Equations

**3. At Mach 32, why is the real gas temperature (8,000-10,000 K) lower than the perfect gas prediction (60,000 K)?**

A) Energy is lost to friction
B) Energy is used for dissociation and ionization
C) The heat shield absorbs the energy
D) The air is thinner at high altitudes

**4. What are the two primary sources of heating for the vehicle during reentry?**

A) Convective and Radiative
B) Frictional and Chemical
C) Solar and Nuclear
D) Magnetic and Kinetic

**5. Which heating source dominates during the lunar reentry of Artemis II?**

A) Convective heating
B) Radiative heating
C) Frictional heating
D) Conductive heating

**6. What is the name of the relation used to determine convective heat flux at the stagnation point?**

A) Reynolds relation
B) Fay-Riddell relation
C) Stefan-Boltzmann law
D) Newton's law of cooling

**7. How does convective heat transfer scale with velocity according to the text?**

A) Linearly
B) Square of velocity
C) Third-power of velocity
D) Inversely

**8. Why is a blunt capsule geometry preferred over a sharp-nosed design for reentry?**

A) To increase fuel efficiency
B) To reduce weight
C) To manage heat by pushing the shock wave farther away
D) To increase subsonic speed

**9. What is the approximate drag coefficient (Cd) for Orion at hypersonic speeds?**

A) 0.5
B) 0.9
C) 1.3
D) 2.1

**10. What is the peak predicted deceleration force (g-force) for the Artemis II crew?**

A) 2g
B) 4g
C) 8g
D) 12g

**11. How does the Artemis II reentry profile differ from Artemis I?**

A) Artemis II uses a skip trajectory
B) Artemis II uses a lofted guidance profile with a single reentry
C) Artemis II enters at a lower Mach number
D) Artemis II uses parachutes earlier

**12. What caused the heat shield damage on Artemis I?**

A) Extreme cold in space
B) Micrometeoroid impacts
C) Gas trapped in the ablator escaping during the skip phase
D) Improper parachute deployment