

Advanced Military Science and Technology History

Military Science · Practice Test · 12 Questions

1. Which chemical process was essential for the German production of explosives during WWI after the British naval blockade severed access to Chilean saltpeter?

- A) The Hall-Hérault process
- B) The Haber-Bosch process
- C) The Ostwald process
- D) The Leblanc process

2. During the Manhattan Project, what specific isotope was primarily utilized for the 'Little Boy' atomic bomb's fission mechanism?

- A) Plutonium-239
- B) Uranium-235
- C) Thorium-232
- D) Uranium-238

3. What ballistic phenomenon explains the instability of the Minie ball's trajectory when fired from a smoothbore barrel compared to a rifled barrel?

- A) Magnus effect
- B) Gyroscopic precession
- C) Turbulent wake detachment
- D) Coriolis acceleration

4. In radar technology development during WWII, which vacuum tube device was critical for generating high-power microwave pulses?

- A) Traveling-wave tube
- B) Klystron
- C) Cavity magnetron
- D) Thyatron

5. What is the primary scientific principle behind the operation of a shaped charge (HEAT) warhead, used to penetrate armor?

- A) Munroe effect
- B) Peltier effect
- C) Seebeck effect
- D) Faraday effect

6. Which metallurgical technique was developed for the P-51 Mustang to allow for laminar flow wing surfaces, significantly reducing aerodynamic drag?

- A) Superplastic forming
- B) Flush riveting
- C) Anodizing
- D) Cryogenic tempering

7. In the development of the V-2 rocket, what propellant combination was used, requiring the use of a steam-driven turbine pump?

- A) Liquid oxygen and kerosene
- B) Liquid oxygen and ethanol
- C) Nitric acid and hydrazine
- D) Liquid hydrogen and liquid oxygen

8. Which property of RDX (Research Department Explosive) makes it significantly more effective than TNT in military applications?

- A) Higher melting point
- B) Superior brisance and detonation velocity
- C) Lower vapor pressure
- D) Higher solubility in water

9. What was the primary cooling mechanism employed in the early air-cooled machine guns like the Lewis Gun?

- A) Peltier thermoelectric cooling
- B) Forced-air convection via a heat sink shroud
- C) Liquid-to-gas phase transition
- D) Radiative heat dissipation in a vacuum

10. What is the scientific basis for the 'proximity fuze' developed during WWII to detonate anti-aircraft shells near targets?

- A) Acoustic resonance
- B) Doppler radar
- C) Magnetic induction
- D) Capacitance proximity sensing

11. Which gas, used as a chemical weapon in WWI, is scientifically classified as a vesicant that alkylates DNA, preventing cell division?

- A) Phosgene
- B) Chlorine
- C) Mustard gas
- D) Hydrogen cyanide

12. What specific innovation in battleship design allowed for the 'all-or-nothing' armor scheme, maximizing protection for vital spaces?

- A) Ceramic-matrix composites
- B) Decarburized face-hardened steel
- C) Multi-layered ballistic nylon
- D) Concrete-filled hulls