1. What are the main components of a jet engine? (4.A)

a. Air inlet, motor, piston, turbine, and exhaust

b. Compressor, piston, fuel injector, turbine, and exhaust

c. Intake, compressor, combustor, turbine, and exhaust

d. Intake, vacuum chamber, fuel injector, compressor, and turbine

2. The part of the “stack” of the space transport system that looks most like an airplane is called   
the\_\_\_\_\_\_\_. (4.B)

a. orbiter

b. external tank

c. capsule

d. rocket

3. Skylab, the United States’ first space station, was used to\_\_\_\_\_\_\_. (4.B)

a. allow astronauts to live and work on it for six months at a time

b. conduct research on and collect samples from the moon

c. perform medical examinations and observations of Earth

d. serve as a base to launch missions to Mars

4. Fill in the blank: The first American astronaut who flew to space was\_\_\_\_\_\_\_\_\_\_\_. (4.B)

a. Wernher von Braun

b. Neil Armstrong

c. Alan Shepard

d. Katherine Johnson

5. The first jet engines were built\_\_\_\_\_\_\_\_. (4.A)

a. to allow civilians to fly across the ocean

b. to determine if a propeller was needed

c. to break the sound barrier

d. for use on military aircraft

6. What was one reason the Soviet Union’s launch of Sputnik in 1957 sparked the United States to want to become number one in space exploration? (4.B)

a. The United States was afraid that the Soviet Union was spying.

b. The United States wanted to use a satellite to take images of the Soviet Union.

c. The Soviet Union was using their satellite to block United States communications.

d. The Soviet Union wanted to establish a colony in space.

7. Why did the US Congress establish NASA in 1958? (4.B)

a. Because the Soviet Union was planning to go to the moon

b. To put emphasis on winning the “space race” against the Soviet Union

c. Because additional regulation was needed to protect astronauts

d. To help protect the United States from the possibility of ground invasion

8. What was the purpose of NASA’s Mercury and Gemini missions in the 1950s and 1960s? (4.B)

a. They began the search for extraterrestrial life.

b. They allowed NASA to test ways to weaponize space.

c. They acted as stepping-stones to landing on the Moon.

d. They sent the initial pieces of the space station into orbit.

9. What event ended the Space Race? (4.B)

a. Neil Armstrong became the first man on the Moon on July 20, 1969.

b. Sputnik I achieved orbit on October 4, 1957.

c. Yuri Gagarin became the first man in space on April 12, 1961.

d. Apollo 8 became the first mission to orbit the Moon on December 24, 1968.

10. NACA hired five female “computers” in 1935 to \_\_\_\_\_\_. (4.B)

a. do basic math that was easy, yet time consuming

b. develop new algorithms for important calculations

c. build software that would assist NACA with improving their technology

d. perform complex calculations so NACA engineers could focus on research

11. How did the invention of jet engine technology impact passenger travel? (4.A)

a. It enabled travel at higher speeds.

b. It allowed aircraft to replace cars.

c. It increased the cost of air travel.

d. It caused more accidents to occur.

12. The Mercury 7 astronauts who were selected in 1959\_\_\_\_\_\_\_. (4.B)

a. were tall men who were skilled athletes

b. were all men who had served as military test pilots

c. were women who had demonstrated exceptional flying abilities

d. were a blend of men and women who were scientists and engineers

13. Why was the swept wing design important in the development of jet engines? (4.A)

a. They decrease the additional weight added by jet engines.

b. They delay the formation of shock waves generated by jet engines.

c. They increase the efficiency at which jet engines burn fuel.

d. They protect jet engines from debris flying in the atmosphere.

14. What made the Space Shuttle such an advancement in aerospace? (4.B)

a. It had the ability to take off like an airplane.

b. It was a reusable spacecraft that could carry humans and cargo.

c. It was made of composite materials and therefore lighter than other rockets.

d. It had aerodynamic designs that allowed it to fly faster than other systems.

15. Why was the competition between the Soviet Union and the United States called the “Space Race?” (4.B)

a. The United States and the Soviet Union were racing for supremacy in spaceflight.

b. The United States and the Soviet Union were racing to be the first to drop a nuclear   
bomb.

c. The United States and the Soviet Union were racing to have the largest space-based   
economy.

d. The United States and the Soviet Union were racing to have the fastest Earth-based rocket ship.

16. After the Cold War ended, what was the relationship between the United States and the Soviet Union regarding space exploration? (4.B)

a. The Soviet Union sent cosmonauts to Skylab aboard U.S. space shuttles.

b. The Soviet Union and the United States continued efforts to militarize and control space.

c. The United States and the Soviet Union started competing to send the first person to Mars.

d. The United States and the Soviet Union started to work together, eventually docking their   
aircraft in space.

17. Power and performance were improved in aircraft because of jet engines, but \_\_\_\_\_\_\_\_\_\_\_\_\_\_. (4.A)

a. the increased speeds led to many fatal accidents.

b. the aircraft designs were greatly impacted as engineers worked to take full advantage of the increased performance provided.

c. the avionics systems were insufficient because they had not developed as rapidly.

d. pilots struggled to control the aircraft upon takeoff and landing due to the extra forces.

18. Fill in the blank: The first operational orbiter to fly in space was the \_\_\_\_\_\_\_\_. (4.B)

a. Columbia

b. Challenger

c. Discovery

d. Atlantis

19. Fill in the blank: Newton’s \_\_\_\_\_\_\_\_ states that every action has an equal and opposite reaction. (4.A)

a. First Law of Motion

b. Third Law of Motion

c. Theory of Relativity

d. Planetary Law

20. The \_\_\_\_\_\_\_ was the first successful commercial jet aircraft for civilian use. (4.A)

a. Benoist Model XIV Airboat

b. Apollo 13

c. Boeing 707

d. XP-80 Shooting Star

21. How did the development of the world’s first jetliner, the Boeing 707, impact society? (4.A)

The B-707 launched the world into the commercial jet age, and we became a much more global society. Commercial jets made travel safer; they made travel quicker and easier; they expanded the economy by bringing people and cultures together and allowing for faster trade.

22. Explain at least two challenges in making an operational jet engine and jet aircraft. (4.A)

It was difficult for engineers to find materials that were suitable for handling the stress involved in   
operating a jet engine (mainly heat and pressure). It was also difficult for them to determine how to   
effectively managing the challenges of high altitude flight and high-speed flight. For example, as a jet   
aircraft approached the speed of sound, vibrations caused by shock waves caused the aircraft to be   
nearly uncontrollable. The development of swept wings solved for this problem.

23. Why was the success of the Mercury program an important achievement during the space race? (4.B)

Mercury was the first program to put astronauts into space. It perfected techniques to orbit a manned spacecraft around Earth, determine an astronaut’s capability to function and live in space, and recover and astronaut and spacecraft safely. Mercury provided important lessons that future missions built on.

24. How did the Apollo-Soyuz mission help build trust between the Americans and Soviets after the Cold War? (4.B)

The Apollo-Soyuz mission represented the first international joint effort in space and was the first of many successful collaborations between the Americans and the Russians. The goal was to dock two spacecraft that were not similar. One of the first challenges was that the astronauts and cosmonauts had to learn each other's languages. The Apollo spacecraft was also redesigned with a module that served as a docking unit and an airlock unit.

25. How was the development of the Space Transport System an important milestone in NASA’s research? (4.B)

The space shuttle program was the first reusable spacecraft. Over the course of 135 missions, it carried important cargo, conducted repair missions, ferried astronauts, and completed experiments in space. It demonstrated important aviation innovations, such as fly-by-wire systems, advanced navigation and control algorithms, and thermal protection systems.