

AI in Space Exploration

Artificial Intelligence In Space · Practice Test · 25 Questions

1. Which NASA mission used the AEGIS (Autonomous Exploration for Gathering Increased Science) AI software to autonomously select rock targets for laser analysis on Mars?

- A) Curiosity Rover
- B) Perseverance Rover
- C) Viking 1
- D) Pathfinder

2. What is the primary function of the AI-based 'Earth Observing-1' (EO-1) spacecraft's Autonomous Sciencecraft Experiment?

- A) To build a space station
- B) To detect volcanic eruptions and floods without waiting for human commands
- C) To track human satellite debris
- D) To refuel other satellites

3. How does AI assist the Kepler Space Telescope in its search for exoplanets?

- A) By physically moving the telescope
- B) By cleaning the telescope lens
- C) By processing light curves to identify dips caused by transiting planets
- D) By cooling the camera sensors

4. What specific task does the 'AI-driven' software on the James Webb Space Telescope perform to ensure high-quality imaging?

- A) Controlling the secondary mirror alignment
- B) Managing oxygen levels
- C) Refueling solar panels
- D) Predicting alien life forms

5. Which algorithm model is frequently used to process massive amounts of radio telescope data to identify potential signals from space?

- A) Linear regression
- B) Neural networks for pattern recognition
- C) Decision trees for weather
- D) K-means for physical soil testing

6. The ESA's 'PHI' (Proba-3) mission utilizes AI for what purpose in its formation-flying experiment?

- A) To prevent space junk collisions
- B) To manage the precise relative positioning of two satellites
- C) To send encrypted messages
- D) To heat the spacecraft cabin

7. AI on the International Space Station (ISS) known as 'CIMON' is primarily used to perform which function?

- A) Docking the station
- B) Assisting astronauts with hands-free tasks and procedures
- C) Stabilizing the station's orbit
- D) Cooking food for the crew

8. In astronomical data analysis, what role do 'Convolutional Neural Networks' (CNNs) play regarding galaxy images?

- A) Classifying galaxy shapes like spiral or elliptical
- B) Calculating the exact distance to the sun
- C) Refueling spacecraft
- D) Measuring oxygen levels on Mars

9. What is the main challenge AI helps overcome when navigating autonomous spacecraft in the asteroid belt?

- A) The lack of solar power
- B) Communication latency with Earth making real-time control impossible
- C) The freezing temperatures of space
- D) The lack of oxygen

10. The 'AutoNav' system on the Perseverance rover is designed to perform what critical task?

- A) Autonomous path planning to avoid hazards like rocks and sand
- B) Calculating the orbit of Earth
- C) Determining the chemical composition of stars
- D) Sending data back to the Moon

11. AI systems used by astronomers to sort 'light curves' are particularly effective at finding what type of astronomical event?

- A) Supernova explosions
- B) Solar flares
- C) Comet tails
- D) Moon eclipses

12. In the context of the 'Deep Space Network', how is AI utilized to optimize communication?

- A) By predicting and scheduling antenna time slots for various missions
- B) By manually rotating antennas
- C) By painting the antennas white
- D) By cleaning the antenna surfaces

13. What allows AI to distinguish between real exoplanet signals and 'instrumental noise' in telescope data?

- A) Deep learning models trained on labeled datasets of light signatures
- B) Human manual observation only
- C) Physical cleaning of the telescope
- D) The temperature of the telescope

14. How does AI help in the 'Space Debris' tracking initiatives?

- A) By calculating collision probabilities for thousands of tracked objects
- B) By physically capturing debris
- C) By sending debris to the sun
- D) By ignoring debris

15. The Mars helicopter 'Ingenuity' used what type of AI-related logic to maintain its flight stability?

- A) Simple mechanical springs
- B) Advanced visual odometry and flight control algorithms
- C) Human remote control every millisecond
- D) Nothing, it was purely mechanical

16. AI is used to scan images from the 'Hubble Space Telescope' to automatically identify what?

- A) Gravitational lenses
- B) Human satellites
- C) Atmospheric clouds on Earth
- D) Space junk on Mars

17. Which agency uses the 'AI-driven' software 'TESS' (Transiting Exoplanet Survey Satellite) data to identify potential worlds?

- A) NASA
- B) SpaceX
- C) Blue Origin
- D) ESA

18. What is the benefit of using AI for 'on-board' satellite data processing?

- A) It reduces the amount of raw data that must be sent back to Earth
- B) It increases the size of the satellite
- C) It makes the satellite heavier
- D) It requires more fuel

19. AI models for planetary mapping use satellite imagery to identify geological features such as:

- A) Impact craters
- B) Subway stations
- C) Ocean liners
- D) Mountain ski resorts

20. The 'Voyager' probes do not use modern AI, yet they are famous for:

- A) Navigating the outer solar system and into interstellar space
- B) Returning to Earth safely
- C) Landing on Saturn
- D) Orbiting the Sun

21. Why are 'Genetic Algorithms' sometimes used in designing satellite antenna arrays?

- A) To evolve the most efficient geometry for signal reception
- B) To make the antennas look better
- C) To reduce the weight to zero
- D) To provide heat to the satellite

22. What does AI help 'Solar Dynamics Observatory' (SDO) scientists do regarding the Sun?

- A) Analyze solar flare activity and magnetic field evolution
- B) Predict the Earth's weather
- C) Measure the temperature of Pluto
- D) Clean the Sun's surface

23. In the search for 'Technosignatures', what role does AI play?

- A) Analyzing massive datasets for non-random, potentially artificial signal patterns
- B) Building radio telescopes
- C) Physically visiting other stars
- D) Looking through a standard telescope

24. AI systems are currently trained to detect 'Lunar transient phenomena' which are defined as:

- A) Short-lived changes in the appearance of the Moon's surface
- B) Moon eclipses
- C) The phases of the Moon
- D) The movement of the Moon

25. The 'ESA' uses AI for 'Mars Express' data to improve the quality of what?

- A) Topographic maps of the Martian surface
- B) The internet on Earth
- C) The oxygen supply
- D) The speed of the rocket