

Asia's Cutting-Edge Discoveries: From Cosmic Rays to Cancer Therapies This

Science · Practice Test · 12 Questions

1. Recent analysis of lunar samples collected by China's Chang'e-6 mission has revealed a significant shift in asteroid bombardment types. What period does this shift primarily indicate, transitioning from non-carbonaceous to carbonaceous asteroids?

- A) Between 1 billion and 500 million years ago
- B) Between 4.3 billion and 2.8 billion years ago
- C) Between 2.8 billion and 1 billion years ago
- D) During the Late Heavy Bombardment period (approximately 4.1 to 3.8 billion years ago)

2. Researchers at National Taiwan University have developed bioinspired composite materials mimicking bone and bamboo. What key AI-driven insight was crucial in their discovery regarding crack resistance?

- A) The optimal ratio of stiff to soft materials
- B) The use of piezoelectric elements for energy absorption
- C) How strategically placed soft layers near cracks can improve both strength and toughness
- D) The development of self-healing capabilities through embedded microcapsules

3. Chinese scientists, using data from the Large High Altitude Air Shower Observatory (LHAASO), have detected ultra-high-energy gamma rays from a gamma-ray binary system. What is the significance of this discovery regarding natural particle accelerators in space?

- A) It confirms the existence of the first artificial particle accelerator in space.
- B) It provides strong evidence that this type of system is a potential PeVatron, capable of accelerating cosmic rays to extremely high energies.
- C) It revealed that gamma-ray binaries are the primary source of dark matter.
- D) It demonstrated that these systems can generate gravitational waves detectable on Earth.

4. A recent report highlights advancements in China's robotics and AI sector. What specific capability has been demonstrated by the 'Lightning' robot developed by Honor, surpassing human athletic records?

- A) It completed a marathon in under two hours.
- B) It achieved a maximum motor torque of 600 newton-meters and completed a half-marathon in 50 minutes and 26 seconds.
- C) It successfully performed complex surgical procedures autonomously.
- D) It navigated an urban environment with 99.9% obstacle avoidance accuracy.

5. In Japan, the Institute of Science Tokyo has rolled out its Robotics Innovation Center, which operates without human staff. What type of lab droids are utilized in this facility?

- A) Xenobots
- B) Droids named 'Maholo'
- C) Bio-bots
- D) Nano-droids

6. A study led by City University of Hong Kong has shed light on the 'Asian Flush' mechanism. What is the primary molecular process identified as being triggered by the ALDH2 mutation during myocardial infarction?

- A) Apoptosis (programmed cell death)
- B) Ferroptosis (a form of programmed cell death)
- C) Necrosis (uncontrolled cell death)
- D) Autophagy (cellular self-cleaning)

7. Chinese scientists, analyzing data from China's Large High Altitude Air Shower Observatory (LHAASO), have identified a natural particle accelerator in space. What is the energy level of the ultra-high-energy gamma rays detected from this object, reaching over 100 trillion electron-volts?

- A) 1 trillion electron-volts
- B) 10 trillion electron-volts
- C) 100 trillion electron-volts
- D) 1,000 trillion electron-volts

8. A new study published in 'Big Earth Data' develops an AI-driven ensemble forecasting model for extreme wind gusts. What key meteorological variables were identified as crucial predictors in this model?

- A) Solar radiation and atmospheric pressure
- B) Barometric-pressure tendencies and humidity
- C) Ocean temperature and wind speed
- D) Cloud cover and precipitation

9. Researchers from Osaka Metropolitan University in Japan have made a discovery concerning all-solid-state batteries. What optimization, without developing costly new materials, can significantly enhance battery performance according to their findings?

- A) Increasing the voltage capacity
- B) Optimizing the particle-size distribution of existing materials
- C) Improving the electrode's surface area
- D) Adding a liquid electrolyte layer

10. China's Hengrui Pharma has entered into a significant multi-faceted alliance with Bristol Myers Squibb. How many early-stage drug prospects are involved in this partnership?

- A) Seven
- B) Ten
- C) Thirteen
- D) Twenty

11. A Chinese astronomical observatory has made a concerning observation regarding the interstellar object 3I/ATLAS. What unusual characteristic was detected in its heat and light emissions, suggesting non-natural behavior?

- A) Chaotic energy spikes inconsistent with known celestial phenomena
- B) Structured, repeating pulses of infrared radiation and photonic flashes
- C) A constant, low-level emission of radio waves
- D) Sudden, unpredictable changes in its magnetic field

12. A new study published in 'Biochar' suggests a method for dealing with plastic-contaminated agricultural waste. What is the proposed solution for creating safer biochar from this waste?

- A) Incineration at extremely high temperatures
- B) Chemical decomposition using strong acids
- C) Conversion into biochar through a specific process
- D) Burying the waste in specialized containment facilities