Astrobiology and Extraterrestrial Biology

Animals And Space Biology · Practice Test · 18 Questions

1. Which resilient microscopic animal is the only known species capable of surviving the vacuum of outer space and exposure to extreme solar radiation?

A) Tardigrada
B) Rotifera
C) Dermestidae
D) Nematoda

2. What is the primary physiological challenge faced by vertebrate animals during long-term exposure to microgravity in orbit?

A) Increased metabolic rate
B) Loss of bone mineral density
C) Rapid increase in lung capacity
D) Hyper-pigmentation of skin

3. Which organism was the first animal to be sent into orbit around the Earth aboard the Sputnik 2 mission?

A) A rhesus macaque
B) A fruit fly
C) A stray dog named Laika
D) A laboratory mouse

4. Tardigrades have been studied for their ability to enter a state of suspended animation, which is known as what?

A) Hibernation
B) Cryptobiosis
C) Aestivation
D) Diapause

5. What is the main biological concern regarding the 'panspermia' hypothesis in the context of extraterrestrial life?

A) The survival of organisms during atmospheric entry
B) The evolution of multicellularity
C) The necessity of a silicon-based metabolism
D) The lack of liquid water on Mars

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6. Which protein complex, often found in animals, is being researched for its role in DNA repair after exposure to cosmic radiation?

A) Hemoglobin
B) Dsup
C) Keratin
D) Myosin

7. In 1973, which species of spiders were sent to Skylab to observe the construction of webs in a microgravity environment?

A) Black widow spiders
B) Araneus diadematus
C) Wolf spiders
D) Tarantulas

8. What are the 'extremophile' animals that live in environments with high salinity or acidity often used as analogs for in the search for life on moons like Europa?

A) Halophiles
B) Xerophiles
C) Cryophiles
D) Barophiles

9. Which of the following animals was successfully bred and gave birth to offspring aboard the Space Shuttle Discovery in 1998?

A) Rattus norvegicus
B) Mus musculus
C) Danio rerio
D) Xenopus laevis

10. The study of how the circulatory system of a giraffe might provide insights into blood pressure management in space is known as what type of research?

A) Comparative physiology
B) Xenobiology
C) Astrogeology
D) Planetary physics

11. Which chemical element is considered the most probable basis for extraterrestrial biological life, given its tetravalent bonding capabilities?

A) Silicon
B) Carbon
C) Nitrogen
D) Phosphorus

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12. Which sensory system in animals is most significantly affected by the absence of a gravity vector in outer space?

A) Visual perception
B) Vestibular system
C) Olfactory bulb
D) Somatosensory cortex

13. The 'Habitable Zone' around a star is defined primarily by the capacity for what specific condition to exist?

A) Liquid water on a planetary surface
B) A high concentration of atmospheric oxygen
C) A stable magnetic field
D) The presence of complex organic molecules

14. What specific type of radiation found in space is most damaging to the genetic material of living organisms?

A) Infrared radiation
B) Galactic cosmic rays
C) Radio waves
D) Visible light

15. Which jellyfish species was sent to space in 1991 to study the impact of microgravity on the development of the vestibular system in offspring?

A) Aurelia aurita
B) Cyanea capillata
C) Chrysaora quinquecirrha
D) Rhizostoma pulmo

16. What effect does microgravity typically have on the immune system function of animals in space?

A) It becomes hyper-active
B) It experiences dysregulation and reduced response
C) It remains completely unchanged
D) It produces higher levels of red blood cells

17. In the context of space biology, what is the 'biosignature' most frequently sought in the atmospheres of exoplanets?

A) Atmospheric methane
B) High surface gravity
C) Metallic deposits
D) Volcanic activity

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18. Which microscopic crustacean was the first animal to be observed mating and producing offspring in space?

A) Daphnia magna
B) Artemia salina
C) Copepoda
D) Ostracoda

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