Cosmic Physical Education

Physical Education And Space Science · Answer Key · 25 Questions

1. What physiological change occurs to the human heart during long-duration spaceflight in microgravity?

A) It becomes permanently enlarged
B) It undergoes cardiac atrophy due to reduced workload
C) It beats faster at all times
D) It stops pumping oxygenated blood

2. Which planet in our solar system has the lowest surface gravity, requiring the least amount of force for a high jump?

A) Mars
B) Mercury
C) Venus
D) Neptune

3. Why do astronauts perform daily resistive exercise on the ISS?

A) To maintain bone density and muscle mass
B) To increase heart rate for fun
C) To generate heat for the station
D) To balance the station's orbit

4. Approximately how much does a 70kg person weigh on the Moon compared to Earth?

A) Same
B) Half
C) One-sixth
D) One-tenth

5. Which form of exercise is most effective for preventing fluid shift issues in microgravity?

A) Yoga
B) Aerobic and resistance training
C) Isometrics only
D) Swimming

6. What is the primary reason high-intensity sprinting is difficult on the Moon?

A) Lack of oxygen
B) Reduced traction due to low gravity
C) Air resistance
D) The suit is too heavy

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7. In terms of sports physics, what happens to a projectile trajectory if thrown on Mars compared to Earth?

A) It goes shorter
B) It goes higher and further
C) It stops immediately
D) It curves left

8. What is 'space adaptation syndrome' most similar to in terrestrial sports?

A) Muscle soreness
B) Motion sickness
C) Heat exhaustion
D) Dehydration

9. Which gas, used in specialized breathing mixtures for deep-sea diving, is monitored in spacecraft environments to prevent physical impairment?

A) Helium
B) Neon
C) Carbon Dioxide
D) Argon

10. What effect does the vacuum of space have on a human body without a pressurized suit?

A) Immediate freezing
B) Explosion
C) Ebullism
D) Instant incineration

11. Which planet has a day length that is closest to Earth's, affecting circadian rhythm-based training?

A) Mars
B) Jupiter
C) Saturn
D) Mercury

12. What is the average human body temperature in Celsius that flight surgeons monitor for astronaut fitness?

A) 35°C
B) 37°C
C) 39°C
D) 40°C

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13. How does microgravity affect the spine compared to terrestrial physical training?

A) It causes compression
B) It causes elongation
C) It makes it brittle
D) It curves it into a circle

14. Which space agency developed the 'ARED' (Advanced Resistive Exercise Device)?

A) ESA
B) NASA
C) JAXA
D) Roscosmos

15. What physical property of the Moon makes it a unique environment for long-distance running?

A) It has a breathable atmosphere
B) It has a surface covered in soft silt
C) It is made of gas
D) It has no gravity

16. Which cardiovascular metric is monitored during astronaut exercise to determine physical capacity?

A) VO2 Max
B) Blood sugar
C) Bone density
D) Eye pressure

17. What is the primary heat dissipation method for humans in space?

A) Convection
B) Conduction
C) Evaporation
D) Radiation

18. Which of these planets has the highest gravity, making physical activity the most strenuous?

A) Jupiter
B) Saturn
C) Uranus
D) Neptune

19. What is the main physical hazard for astronauts performing EVAs (spacewalks)?

A) Gravity waves
B) Orbital debris
C) Atmospheric drag
D) Radiation burns

20. How does long-term spaceflight affect the vestibular system, crucial for balance in sports?

A) It improves it
B) It causes permanent loss
C) It disrupts sensory input
D) It has no effect

21. Which organ is responsible for the 'balance' component of physical fitness and is affected in space?

A) Inner ear
B) Heart
C) Liver
D) Lungs

22. What is the orbital speed required to maintain a low Earth orbit, affecting the physics of 'stationary' exercises?

A) 1,000 km/h
B) 7,660 m/s
C) 50,000 km/h
D) 100 m/s

23. How is resistance simulated in space where traditional weights would be weightless?

A) Bungee cords and vacuum cylinders
B) Magnets
C) Springs
D) Pure willpower

24. Which type of radiation poses a physical health risk to astronauts during prolonged stays outside the magnetosphere?

A) Solar particle events
B) Radio waves
C) Visible light
D) Infrared

25. What is the term for the decrease in muscle size that occurs in space?

A) Hypertrophy

B) Atrophy

C) Dystrophy

D) Hypoplasia

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