ELON SUMMER SCHOOL

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G-11 Physics Unit 1

Topic: Importance of Physics to Society - Physics Communities and Their Roles

1. Why is the Greek word for nature appropriate in describing the field of physics?
A. Physics is a natural science that studies life and living organism on habitable planets like Earth.
B. Physics is a natural science that studies the laws and principles of our universe.
C. Physics is a physical science that studies the composition, structure, and changes of matter in our universe.
D. Physics is a social science that studies the social behavior of living beings on habitable planets like Earth.
2. Which of the following is NOT a contribution of physics to addressing climate change?
A. Studying the behavior of the atmosphere, oceans, and ice sheets
B. Developing renewable energy technologies

C. Mitigating the effects of climate change
D. Enhancing our understanding of other disciplines
3. How does physics contribute to technological advancements in healthcare?
A. By improving food preservation techniques
B. By developing medical imaging and radiation therapy
C. By creating new pharmaceutical drugs
D. By designing ergonomic hospital furniture
4. Which of the following best describes fundamental knowledge in physics?
A. It consists of advanced mathematical techniques
B. It involves understanding core principles and concepts
C. It focuses solely on experimental data

D. It pertains to historical scientific achievements
5. What role does physics play in combating climate change?
A. It develops strategies for genetic modification of crops
B. It enhances the production of fossil fuels
C. It aids in developing cleaner energy technologies
D. It focuses on traditional farming methods
6. What is the significance of the equation $E=mc^2$ in physics?
A. It explains the principles of fluid dynamics
B. It describes the law of conservation of momentum

C. It relates mass and energy, laying the groundwork for nuclear energy
D. It is used for calculating gravitational forces

7. Which area is directly impacted by the application of the law of motion $F = ma$?
A. Genetic engineering
B. Satellite launching and space exploration
C. Culinary arts
D. Textile manufacturing
8. How does physics contribute to the global economy?
A. By developing artistic techniques
B. By training personnel for technological and scientific advancements
C. By conserving historical artifacts

D. By supporting the tourism industry

9. Which imaging technique uses a strong magnetic field and radio waves to generate detailed images of soft tissues?
A. Computer Tomography (CT)
B. Ultrasonic Imaging
C. Magnetic Resonance Imaging (MRI)
D. Positron Emission Tomography (PET)

10. In what way does physics enhance communication technologies?
A. By developing new languages
B. By advancing fiber optics and wireless communication
C. By improving handwriting recognition
D. By designing new printing devices
11. What is the role of physics in improving quality of life through medical imaging?
A. It enhances the taste of food through sensory technology.

B. It uses principles of light to create better eyewear.

C. It enables techniques like MRI and CT scans for diagnosis.

D. It improves the efficiency of exercise routines.
12. Which principle is essential for the functioning of semiconductors in electronic devices?
A. Newton's laws of motion
B. Quantum mechanics
C. Thermodynamics
D. Classical mechanics
13. Lasers are utilized in various fields due to their ability to amplify light by which process?
A. Reflection B. Refraction C. Stimulated emission D.

Diffraction

14. Which technology relies on the principles of relativity for accurate functioning?

A. X-rays B. GPS devices C. Bar code scanners D. Radio transmitters

15. What form of electromagnetic radiation is used for medical imaging and materials analysis?

A. Ultraviolet light B. Gamma rays C. X-rays D. Microwaves

16. Bar code scanners operate based on which physical principle?

A. Optics and light reflection C. Quantum entanglement

C. Nuclear magnetic resonance D. Particle acceleration

17. What is one of the primary objectives of the Ethiopian Physical Society (EPS)?

A. To develop new physics textbooks

B. To promote physics education and research in Ethiopia

C. To create international physics competitions

D. To fund physics projects in Asia

18. Which of the following is NOT an objective of the Ethiopian Physical Society (EPS)?

A. To promote physics education and research in the country

B. To organize and coordinate conferences on physics education

C. To fund international physics research projects

D. To popularize physics and engage the public in curriculum design

19. Which organization aims to support Ethiopian Physics professionals in North America?

A. African Association of Physics Students (aaps)

B. Ethiopian Physical Society (EPS)

C. Ethiopian Physics Society in North America (EPSNA)

D. International Physics Union

20. What is the main focus of the African Association of Physics Students (aaps)?

A. To develop physics curricula for African universities

B. To encourage physics students in their scientific and professional work

C. To organize physics tournaments in Africa

D. To provide grants for physics research in Europe

21. How does EPSNA support the education and training of Ethiopian Physics professionals? A. By organizing international physics fairs

B. By donating educational materials and providing scholarships

C. By publishing physics journals

D. By building physics laboratories in Europe
22. Which of the following is a mitigation strategy informed by physics?

A. Enhancing fossil fuel extraction
B. Developing nuclear weapons
C. Transitioning to renewable energy
D. Increasing agricultural emissions
23. Which of the following technologies is not in line with its fundamental scientific principles?
A. Radio and Television ⟶ Generation, propagation and detection of electromagnetic waves
B. Computers ⟶ Digital logic
C. Electric generator ⟶ Faraday's law of electromagnetic induction
D. Rocket propulsion ⟶ Archimedes' principles

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