

PHYSICAL WORLD

FACT/DEFINITION TYPE QUESTIONS

- The branch of science which deals with nature and natural phenomena is called
(a) Sociology (b) Biology
(c) Civics (d) Physics
- Science is exploring, ...x... and ...y... from what we see around us. Here, x and y refer to
(a) qualitative, modify (b) experiment, predict
(c) verification, predict (d) reasoning, quantitative
- The person who has been awarded the title of the Father of Physics of 20th century is
(a) Madame Curie (b) Sir C.V. Raman
(c) Neils Bohar (d) Albert Einstein
- The man who is known as the Father of Experimental Physics is
(a) Newton (b) Albert Einstein
(c) Galileo (d) Rutherford
- Macroscopic domain includes
(a) phenomena at the laboratory
(b) terrestrial scales
(c) astronomical scales
(d) All of the above
- The man who has won Nobel Prize twice in physics is
(a) Einstein (b) Bardeen
(c) Heisenberg (d) Faraday
- Prof. Albert Einstein got nobel prize in physics for his work on
(a) special theory of relativity
(b) general theory of relativity
(c) photoelectric effect
(d) theory of specific heats
- Which of the following is wrongly matched ?
(a) Barometer-Pressure
(b) Lactometer-Milk
(c) Coulomb's law-charges
(d) Humidity-Calorimeter
- C.V. Raman got Nobel Prize for his experiment on
(a) dispersion of light (b) reflection of light
(c) deflection of light (d) scattering of light
- Louis de-Broglie is credited for his work on
(a) theory of relativity
(b) electromagnetic theory
(c) matter waves
(d) law of distribution of velocities
- Madam Marie Curie won Nobel Prize twice which were in the field of
(a) Physics and chemistry (b) Chemistry only
(c) Physics only (d) Biology only
- A scientific way of doing things involve
(a) identifying the problem
(b) collecting data
(c) hypothesising a possible theory
(d) All of the above
- Two Indian born physicists who have been awarded Nobel Prize in Physics are
(a) H. J. Bhabha and APJ Kalam
(b) C.V. Raman and S. Chandrasekhar
(c) J.C. Bose and M.N. Saha
(d) S. N. Bose and H. J. Bhabha
- Who gave general theory of relativity?
(a) Einstein (b) Marconi
(c) Ampere (d) Newton
- Who discovered X-rays?
(a) Chadwick (b) Roentgen
(c) Thomson (d) Madam Curie
- The field of work of S. Chandrasekhar is
(a) theory of black hole (b) Cosmic rays
(c) theory of relativity (d) X-rays
- When we hold a book in our hand, we are balancing the gravitational force on the book due to
(a) normal force provided by our hand
(b) friction force provided by our book
(c) both (a) and (b)
(d) None of these



18. Which of the following has infinite range?
 (a) Gravitational force (b) Electromagnetic force
 (c) Strong nuclear force (d) Both (a) and (b)
19. Which of the following is the correct decreasing order of the strengths of four fundamental forces of nature?
 (a) Electromagnetic force > weak nuclear force > gravitational force > strong nuclear force
 (b) Strong nuclear force > weak nuclear force > electromagnetic force > gravitational force
 (c) Gravitational force > electromagnetic force > strong nuclear force > weak nuclear force
 (d) Strong nuclear force > electromagnetic force > weak nuclear force > gravitational force
20. The exchange particles for the electromagnetic force are
 (a) gravitons (b) gluons
 (c) photons (d) mesons
21. Which of the following is true regarding the physical science?
 (a) They deal with non-living things
 (b) The study of matter are conducted at atomic or ionic levels
 (c) Both (a) and (b)
 (d) None of these
22. Which of the following is the weakest force?
 (a) Nuclear force (b) Gravitational force
 (c) Electromagnetic force (d) None of these
23. The scientific principle involves in production of ultra high magnetic fields is
 (a) super conductivity (b) digital logic
 (c) photoelectric effect (d) laws of thermodynamics

STATEMENT TYPE QUESTIONS

24. Consider the following statements and select the correct statement(s).
 I. Optics deal with the phenomena involving light.
 II. Unification means physical phenomena in terms of few concepts and laws.
 III. Macroscopic domain of Physics deals with the constitution and structure of matter at the minute scales of atoms and nuclei.
 (a) Only I (b) Only II
 (c) I and II (d) II and III
25. Which of the following statements is/are correct?
 I. Strong nuclear force binds protons and neutrons in a nucleus.
 II. In twentieth century, silicon chip triggered a revolutionary changes in technology of computer system.
 III. The fossil fuels of the planet are dwindling fast and there is urgent need to discover new source of energy.

- (a) Only I (b) Only III
 (c) I and II (d) I, II and III

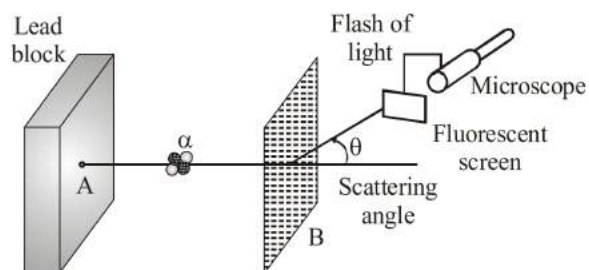
MATCHING TYPE QUESTIONS

Match the Column I and Column II.

26. **Column I** **Column II**
 (A) Johannes Kepler (1) Nuclear model of the atom
 (B) Tycho Brahe (2) Planetary motion
 (C) Nicolas Copernicus (3) Elliptical orbit theory
 (D) Ernest Rutherford (4) Circular orbit theory
 (a) (A)→(2); (B)→(4); C→(3); (D)→(1)
 (b) (A)→(1); (B)→(2); C→(3); (D)→(4)
 (c) (A)→(2); (B)→(1); C→(4); (D)→(3)
 (d) (A)→(3); (B)→(2); C→(4); (D)→(1)
27. **Column I** **Column II**
 (A) Galileo Galilei (1) Explanation of photoelectric effect.
 (B) JC Bose (2) Law of inertia.
 (C) Albert Einstein (3) Discovery of Ultra short radio waves.
 (D) JJ Thomson (4) Discovery of electron.
 (a) (A)→(2); (B)→(3); C→(1); (D)→(4)
 (b) (A)→(1); (B)→(2); C→(4); (D)→(3)
 (c) (A)→(1); (B)→(2); C→(3); (D)→(4)
 (d) (A)→(3); (B)→(4); C→(1); (D)→(2)
28. **Column I** **Column II**
 (A) J.C Maxwell (1) Verified experimentally the prediction of electromagnetic force.
 (B) Carlo Rubia (2) Unified electricity, magnetism and optics, showed that light is an EM waves.
 (C) Isaac Newton (3) Unified celestial and terrestrial mechanics.
 (D) Michael Faraday (4) Showed that electric and magnetic phenomenon i.e., electromagnetism.
 (a) (A)→(1); (B)→(2); C→(4); (D)→(3)
 (b) (A)→(2); (B)→(1); C→(3); (D)→(4)
 (c) (A)→(2); (B)→(3); C→(4); (D)→(1)
 (d) (A)→(2); (B)→(1); C→(4); (D)→(3)

DIAGRAM TYPE QUESTIONS

29. In Rutherford, alpha particle scattering experiment as shown in given figure, A and B refer to



- (a) polonium sample and aluminium foil
- (b) polonium sample and gold foil
- (c) uranium sample and gold foil
- (d) uranium sample and aluminium foil

ASSERTION- REASON TYPE QUESTIONS

Directions : Each of these questions contains two statements, Assertion and Reason. Each of these questions also has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.

- (a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.
 - (b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion
 - (c) Assertion is correct, reason is incorrect
 - (d) Assertion is incorrect, reason is correct.
30. **Assertion :** The concept of energy is central to Physics and expression for energy can be written for every physical system.
Reason : Law of conservation of energy is not valid for all forces and for any kind of transformation between different forms of energy.
31. **Assertion :** Electromagnetic force is much stronger than the gravitational force.
Reason : Electromagnetic force dominates all phenomena at atomic and molecular scales.



HINTS AND SOLUTIONS

FACT/DEFINITION TYPE QUESTIONS

1. (d)
2. (b) Science is exploring, experimenting and predicting from what we see around us.
3. (d) 4. (c)
5. (d) The macroscopic domain includes phenomena at the laboratory, terrestrial and astronomical scales.
6. (b) 7. (c) 8. (d) 9. (d)
10. (c) 11. (a) 12. (d) 13. (b)
14. (a) 15. (b) 16. (a)
17. (a) When we hold a book in our hand, we are balancing the gravitational force on the book due to the huge mass of the Earth by the 'normal force' provided by our hand.
18. (d) 19. (d) 20. (c) 21. (c)
22. (b) 23. (a)

STATEMENT TYPE QUESTIONS

24. (a) Optics deals with the phenomena involving light. The working of telescopes and microscopes, colours exhibited by thin films, etc., are topics in optics. The microscopic domain of Physics deals with the constitution and structure of matter at the minute scales of atoms and nuclei (and even lower scales of length) and their interaction with different probes such as electrons, photons and other elementary particles.
25. (d) In a nucleus, strong nuclear force (strongest fundamental force) binds protons and neutrons. The silicon 'chip' triggered the computer revolution the last three decades of the twentieth century. A most significant area to which Physics has and will contribute is the development of alternative energy resources. The fossil fuels of the planet are dwindling fact and there is an urgent need to discover new and affordable sources of energy.

MATCHING TYPE QUESTIONS

26. (a) Johannes Kepler examined the extensive data on planetary motion collected by Tycho Brahe the planetary circular orbits in heliocentric theory (Sun at the centre of the solar system) imagined by Nicolas Copernicus had to be replaced by elliptical orbits to fit the data better.
27. (a)

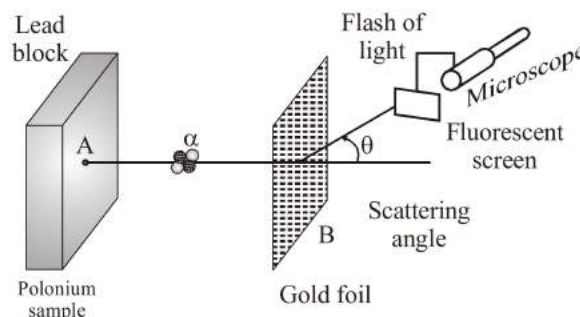
Name of the physicist	Major contribution /discovery	Country of origin
Galileo Galilei	Law of inertia	Italy
JC Bose	Ultra short radio waves	India
JJ Thomson	Electron	Uk
Albert Einstein	Explanation of photoelectric effect; Theory of relativity	Germany

28. (b)

Name of the Physicist	Year	Achievement in unification
Isaac Newton	1687	Unified celestial and terrestrial mechanics, showed that the same laws of motion and the law of gravitation apply to both the domains.
Michael Faraday	1830	Showed phenomena of electromagnetism.
J.C. Maxwell	1873	Unified electricity, magnetism and optics, showed that light is an electromagnetic wave.
Cario Rubia	1984	Verified experimentally the predictions of the theory of electromagnetic force.

DIAGRAM TYPE QUESTIONS

29. (b) The alpha particle scattering experiment of Rutherford gave the nuclear model of the atom as shown in figure



ASSERTION- REASON TYPE QUESTIONS

30. (c) The concept of energy is central to Physics and the expressions for energy can be written for every physical system. When all forms of energy e.g., Heat, mechanical energy, electrical energy etc., are counted, it turns out that energy is conserved. The general law of conservation of energy is true for all forces and for any kind of transformation between different forms of energy.
31. (a) It is mainly the electromagnetic force that governs the structure of atoms and molecules, the dynamics of chemical reactions and the mechanical, thermal and other properties of materials.