

Chapter 1

Physical World

Solutions**SECTION - A****Objective Type Questions****(Physics, Technology and Society)**

1. "Science is not just a collection of laws, a catalogue of unrelated facts. It is a creation of human mind, with its freely invented ideas and concepts." Who made these remarks?

(1) Newton (2) Maxwell (3) Einstein (4) Raman

Sol. Answer (3)

2. "The most incomprehensible thing about the world is that it is comprehensible." Who made these remarks?

(1) Newton (2) Maxwell (3) Einstein (4) Raman

Sol. Answer (3)

3. "We know very little and yet it is astonishing that we know so much, and still more astonishing that so little knowledge (or science) can give us so much power." Who made these remarks?

(1) Newton (2) Maxwell (3) Einstein (4) Bertrand Russel

Sol. Answer (4)

4. "I do not know what I may appear to the world, I seem to have been only like a boy playing on the sea-shore and diverting myself every now and then finding a smoother pebble or a prettier shell than ordinary, while the great ocean of truth lay undiscovered before me." Who said this?

(1) Newton (2) Maxwell (3) Einstein (4) Raman

Sol. Answer (1)

5. Which of the following statements given below are false?

- a. Becquerel discovered radioactivity
- b. Fraunhofer lines were first discovered by Wollaston
- c. Photoelectric effect was discovered by Einstein

(1) a, b & c (2) a & c (3) b & c (4) c only

Sol. Answer (4)

6. The persons, who were given Nobel prize twice, are

- (1) Madame Curie and Albert Einstein
- (2) John Bardeen and Albert Einstein
- (3) Max Planck and Albert Einstein
- (4) Madame Curie and John Bardeen

Sol. Answer (4)

7. The scientific principle involved in supercomputers is

- (1) Electromagnetic induction
- (2) Thermodynamics
- (3) Superconductivity
- (4) Amplification by population inversion

Sol. Answer (3)

8. Choose the correct statement.

- (1) Strong nuclear force is mediated by the particle ' π -meson'
- (2) Weak nuclear force is mediated by the particle 'Boson'
- (3) Electromagnetic force is mediated by the particle 'photon' and gravitational force is mediated by the particle 'graviton'
- (4) All of these

Sol. Answer (4)

9. Choose the correct statement.

- (1) Gravitational force is conservative
- (2) Electrostatic force is conservative
- (3) Nuclear force is non-conservative
- (4) All of these

Sol. Answer (4)

10. Choose the correct statement.

- (1) Gravitational force is a central force
- (2) Electromagnetic force is a central force
- (3) Nuclear force is a non-central force
- (4) All of these

Sol. Answer (4)

11. Choose the correct statement.

- (1) Gravitational force is not affected by intervening medium
- (2) Electromagnetic force is affected by intervening medium
- (3) Nuclear force does not obey inverse square law
- (4) All of these

Sol. Answer (4)

(Fundamental Forces in Nature, Nature of Physical Laws)

12. The exchange particles responsible for weak interactions are

- (1) Gluons (2) π -mesons (3) Photons (4) W and Z bosons

Sol. Answer (4)

Weak interaction takes place through the exchange of BOSONS \rightarrow W and Z bosons

13. Maxwell unified

- (1) Electricity with gravitation
(2) Electricity with magnetism
(3) Electromagnetism with optics
(4) Electromagnetism with weak interaction

Sol. Answer (3)

Maxwell unified electromagnetism with optics.

14. Which of the following is not a derived force?

- (1) Tension in a string (2) van der Waals forces
(3) Nuclear force between proton-proton (4) Electrostatic force between proton-proton

Sol. Answer (4)

Electrostatic force between proton-proton is a fundamental force.

15. Which one of the following does not experience strong nuclear force?

- (1) Leptons (2) Baryons (3) Hadrons (4) Proton

Sol. Answer (1)

Leptons does not experience strong nuclear force.

SECTION - B**Assertion - Reason Type Questions**

1. A : Quark-quark force is said to be fundamental force instead of strong nuclear force.

R : Nucleons consist of more fundamental particles known as quarks.

Sol. Answer (1)

2. A : Gravitational force is the weakest force among all other forces.

R : Gravitational force between the two masses is independent of the medium in between.

Sol. Answer (2)

3. A : Gravitational force dominates terrestrial phenomena.

R : Matter is mostly electrically neutral and gravitational force are only of attractive nature.

Sol. Answer (1)

4. A : Gravitational force is always attractive but electromagnetic force can be attractive or repulsive.

R : Mass comes only in one variety (there is no negative mass) but charge comes in two varieties. (Positive and negative charge)

Sol. Answer (1)

5. A : If m and m_0 are moving mass, rest mass of a body and c is velocity of light, then kinetic energy of the body is $E = (m - m_0)c^2$.

R : Total energy of a body is sum of kinetic energy and rest mass energy.

Sol. Answer (1)

