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Physics Grade 10 — Chapter 6

Electrostatics

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Independent practice MCQs from the supplied Class 10 Physics DeepSeek notes PDF. Total: 43 questions.

A. Important / Main Topics

1. Electrostatics is the study of:

(A) Stationary charges
(B) Moving charges
(C) Magnetic fields
(D) Electric circuits

Correct Answer: A

Explanation: Electrostatics deals with charges that are not moving (stationary charges).

2. The two types of electric charge are:

(A) Positive and neutral
(B) Positive and negative
(C) Negative and neutral
(D) North and south

Correct Answer: B

Explanation: There are two types of charge: positive and negative.

3. Like charges:

(A) Attract each other
(B) Have no effect on each other
(C) Repel each other
(D) Combine to form neutral charge

Correct Answer: C

Explanation: Like charges Repel each other.

4. Opposite charges:

(A) Repel each other
(B) Have no effect on each other
(C) Destroy each other
(D) Attract each other

Correct Answer: D

Explanation: Opposite charges Attract each other.

5. The SI unit of charge is:

(A) Coulomb
(B) Newton
(C) Joule
(D) Ampere

Correct Answer: A

Explanation: The SI unit of charge is Coulomb.

6. When an object loses electrons, it becomes:

(A) Negatively charged
(B) Positively charged
(C) Neutral
(D) Magnetized

Correct Answer: B

Explanation: When an object loses electrons, it becomes Positively charged.

7. When an object gains electrons, it becomes:

(A) Positively charged
(B) Neutral
(C) Negatively charged
(D) Magnetized

Correct Answer: C

Explanation: When an object gains electrons, it becomes Negatively charged.

8. The law of conservation of charge states that charge:

(A) Can be created
(B) Can be destroyed
(C) Is always positive
(D) Cannot be created or destroyed, only transferred

Correct Answer: D

Explanation: Charge cannot be created or destroyed; it is only transferred between objects.

9. Which particle is transferred when objects are charged by friction?

(A) Electron
(B) Proton
(C) Neutron
(D) Nucleus

Correct Answer: A

Explanation: Electrons are transferred during charging; protons and neutrons stay in the nucleus.

10. Materials that allow electric charge to flow freely are called:

(A) Insulators
(B) Conductors
(C) Semiconductors
(D) Resistors

Correct Answer: B

Explanation: Materials that allow electric charge to flow freely are called Conductors.

11. Materials that resist the flow of electric charge are called:

(A) Conductors
(B) Metals
(C) Insulators
(D) Semiconductors

Correct Answer: C

Explanation: Insulators resist charge flow because their electrons are tightly bound.

12. An electroscope is used to:

(A) Measure electric current
(B) Measure magnetic field
(C) Generate electricity
(D) Detect the presence and sign of electric charge

Correct Answer: D

Explanation: An electroscope is used to Detect the presence and sign of electric charge.

13. The direction of the electric field at a point is the direction of the force on:

(A) A positive test charge
(B) A negative test charge
(C) A neutral particle
(D) A magnetic monopole

Correct Answer: A

Explanation: The electric field direction is the direction of force on a positive test charge.

14. Electric field lines point:

(A) Towards positive charges
(B) Away from positive charges and towards negative charges
(C) Away from negative charges
(D) In random directions

Correct Answer: B

Explanation: Field lines point away from positive charges and towards negative charges.

15. The electrons responsible for conduction in metals are:

(A) Inner-shell electrons
(B) Protons
(C) Free (valence) electrons
(D) Neutrons

Correct Answer: C

Explanation: Valence electrons that are loosely bound (free electrons) carry charge in conductors.

16. In a conductor, charge tends to concentrate at:

(A) Flat surfaces
(B) Smooth areas
(C) The center
(D) Sharp points

Correct Answer: D

Explanation: In a conductor, charge tends to concentrate at Sharp points.

17. On a spherical conductor, charge distributes:

(A) Evenly over the surface
(B) Only at the top
(C) At the center
(D) Only at the bottom

Correct Answer: A

Explanation: On a spherical conductor, charge distributes Evenly over the surface.

18. On an insulator, charge:

(A) Spreads evenly
(B) Remains where it is introduced
(C) Concentrates at sharp points
(D) Flows to the ground

Correct Answer: B

Explanation: Charge cannot move freely on an insulator, so it stays where it is placed.

19. Which of the following is a good conductor?

(A) Rubber
(B) Glass
(C) Copper
(D) Plastic

Correct Answer: C

Explanation: Copper is a metal with free electrons, making it a good conductor.

20. Which of the following is a good insulator?

(A) Aluminum
(B) Silver
(C) Copper
(D) Rubber

Correct Answer: D

Explanation: Rubber is an insulator; its electrons are tightly bound.

21. The free electron model explains the difference between:

(A) Conductors and insulators
(B) Positive and negative charges
(C) Protons and neutrons
(D) Magnets and non-magnets

Correct Answer: A

Explanation: The free electron model explains the difference between Conductors and insulators.

B. Less Important / Secondary Topics

22. Valence electrons are:

(A) Electrons in the outermost atomic orbits
(B) Inner-shell electrons
(C) Protons in the nucleus
(D) Neutrons in the nucleus

Correct Answer: A

Explanation: Valence electrons are in the outermost atomic orbits and determine conductor/insulator behavior.

23. The electroscope works on the principle that:

(A) Like charges attract
(B) Like charges repel; opposite charges attract
(C) Charges have no effect on each other
(D) Charges always attract

Correct Answer: B

Explanation: The electroscope works on the principle that like charges repel and opposite charges attract.

24. The leaf of a gold-leaf electroscope diverges when:

(A) It is neutral
(B) It is heated
(C) It is charged
(D) It is cooled

Correct Answer: C

Explanation: The leaf diverges when the electroscope is charged due to repulsion.

25. When a charged object touches the metal disk of an electroscope, the charge:

(A) Stays on the disk only
(B) Disappears
(C) Goes to the ground
(D) Spreads to the rod and leaf

Correct Answer: D

Explanation: When a charged object touches the metal disk of an electroscope, the charge Spreads to the rod and leaf.

26. If a negatively charged rod is brought near a negatively charged electroscope, the leaf:

(A) Diverges further
(B) Collapses
(C) Remains unchanged
(D) Falls off

Correct Answer: A

Explanation: If a negatively charged rod is brought near a negatively charged electroscope, the leaf Diverges further.

27. If a positively charged rod is brought near a negatively charged electroscope, the leaf:

(A) Diverges further

(B) Collapses
(C) Remains unchanged
(D) Falls off

Correct Answer: B

Explanation: The positive charge on the rod attracts electrons from the leaf, causing it to collapse.

28. To determine the sign of an unknown charge using an electroscope, you must first:

(A) Ground the electroscope
(B) Heat the electroscope
(C) Charge the electroscope with a known charge
(D) Cool the electroscope

Correct Answer: C

Explanation: The electroscope must be pre-charged with a known charge to determine the sign of an unknown charge.

29. The electric field is defined as:

(A) Charge per unit force
(B) Energy per unit charge
(C) Power per unit charge
(D) Force per unit charge

Correct Answer: D

Explanation: Electric field intensity is the force per unit positive test charge:.

30. The SI unit of electric field intensity is:

(A) N/C
(B) N
(C) C
(D) C/N

Correct Answer: A

Explanation: The unit of electric field intensity is newton per coulomb (N/C).

31. Electric field lines were introduced by:

(A) Einstein
(B) Faraday
(C) Newton
(D) Coulomb

Correct Answer: B

Explanation: Electric field lines were introduced by Faraday.

32. The electric field inside a charged conducting sphere is:

(A) Maximum
(B) Equal to the surface field
(C) Zero
(D) Infinite

Correct Answer: C

Explanation: The electric field inside a charged conducting sphere is zero.

33. E = F/q 0 The electric field between two oppositely charged parallel plates is:

(A) Non-uniform
(B) Zero
(C) Infinite
(D) Uniform

Correct Answer: D

Explanation: The electric field between parallel plates is uniform — constant in magnitude and direction.

34. How much force is exerted on a charge of in a field of strength (right)?

(A) 1.7 N (left)
(B) 1.7 N (right)
(C) 3.4 N (left)
(D) 3.4 N (right)

Correct Answer: A

Explanation: For a negative charge, the force is opposite to the field direction, i.e., left.

35. If the field strength in MCQ 38 is doubled, how much force is exerted on a charge of ?

(A) 1.7 N (left)
(B) 3.4 N (right)
(C) 3.4 N (left)
(D) 1.7 N (right)

Correct Answer: B

Explanation: For a positive charge, the force is in the field direction (right).

36. Find the magnitude of the positive test charge that experiences a force of 0.5 N when placed in an electric field of 2.0 N/C.

(A) 1.0 C
(B) 4.0 C
(C) 0.25 C
(D) 0.5 C

Correct Answer: C

Explanation: "0.25 C" is correct: it matches the idea asked in the question ("Find the magnitude of the positive test charge that experiences a force of 0.5 N when placed in an electric field of 2.0 N/C"), while the other choices do not.

37. In an electrostatic precipitator, dust particles are attracted to:

(A) A positively charged mesh only
(B) A magnetic field
(C) A neutral surface
(D) A negatively charged mesh (or collecting plate)

Correct Answer: D

Explanation: Charged dust particles are attracted to oppositely charged collecting plates or meshes.

38. The process used in photocopiers is called:

(A) Xerography
(B) Electropainting
(C) Electromagnetism
(D) Electrolysis

Correct Answer: A

Explanation: Xerography is the electrostatic process used in photocopiers.

39. In xerography, the drum is charged by a:

(A) Laser
(B) Corotron
(C) Magnet
(D) Heater

Correct Answer: B

Explanation: The corotron is a high-voltage wire used to charge the drum.

40. In electropainting, the car body and the paint have:

(A) The same charge
(B) No charge
(C) Opposite charges
(D) Magnetic charges

Correct Answer: C

Explanation: The car body and paint have opposite charges so that the paint is attracted to the car.

41. Laser printers use which of the following to create an image on the drum?

(A) Ink
(B) Magnetic field
(C) Ultrasound
(D) Laser beam

Correct Answer: D

Explanation: Laser beam — this correctly answers the question.

42. Corona discharge appears around:

(A) Sharp points at high voltage
(B) Flat surfaces
(C) Insulated wires
(D) Neutral objects

Correct Answer: A

Explanation: Corona discharge appears as a glow around sharp points at high voltages.

43. The lightning rod was invented by:

(A) Einstein
(B) Benjamin Franklin
(C) Newton
(D) Faraday

Correct Answer: B

Explanation: The lightning rod was invented by Benjamin Franklin.