Chapter 4: Electrostatics

MCQs;

1. Coulomb's law gives the force between:
a) Two masses
b) Two charges
c) A charge and a mass
d) Two neutral objects
Answer: b)

2. The force between two charges is inversely proportional to the:
a) Square of the distance between them
b) Square root of the distance between them
c) Distance between them
d) Distance between their centers
Answer: a)

3. What is the unit of electric charge?
a) Ampere
b) Coulomb
c) Volt
d) Ohm
Answer: b)

4. The force between two charges is directly proportional to:
a) The square of the distance between them
b) The distance between them
c) The product of their magnitudes
d) The sum of their charges
Answer: c)

5. What happens to the electrostatic force between two charges if the distance between them is doubled?
a) The force becomes four times weaker
b) The force becomes half as weak
c) The force becomes twice as strong
d) The force becomes four times stronger
Answer: a)

6. If the distance between two charges is halved, the electrostatic force between them:
a) Remains the same
b) Becomes four times greater
c) Becomes half as strong
d) Becomes twice as strong
Answer: b)

7. The electric field intensity at a point is defined as:
a) Force per unit charge
b) Charge per unit force
c) Force per unit mass
d) Charge per unit area
Answer: a)

8. The SI unit of electric field intensity is:
a) Volt
b) Newton per Coulomb (N/C)
c) Coulomb
d) Ampere
Answer: b)

9. The direction of the electric field is always:
a) From positive charge to negative charge
b) From negative charge to positive charge
c) From the center of the charge outward
d) From the center of the charge inward
Answer: a)

10. The electric potential energy of a system of charges is:
a) Always positive
b) Always negative
c) Positive or negative depending on the charges
d) Zero
Answer: c)

11. A positive test charge placed in an electric field will move:
a) In the direction of the field
b) Opposite to the direction of the field

c) Perpendicular to the direction of the field
d) In a random direction
Answer: a)

12. The electric potential at a point is defined as:
a) Energy per unit charge
b) Force per unit charge
c) Charge per unit area
d) Energy per unit area
Answer: a)

13. The potential difference between two points is 1 volt when:
a) 1 joule of energy is used to move 1 coulomb of charge
b) 1 joule of energy is used to move 1 ampere of current
c) 1 watt of energy is used to move 1 coulomb of charge
d) 1 coulomb of charge moves through a 1 ohm resistor
Answer: a)

14. Which of the following is true for conductors?
a) Electrons cannot move freely in a conductor
b) Conductors have high resistance to current flow
c) Conductors allow electric charges to move freely
d) Conductors do not allow any flow of current
Answer: c)

15. A capacitor stores electrical energy in the form of:
a) Electric charge
b) Electric potential
c) Electric field
d) Electric current
Answer: c)

16. The capacitance of a capacitor depends on:
a) The material of the plates
b) The distance between the plates
c) The surface area of the plates
d) All of the above
Answer: d)

17. The electric field inside a conductor is:
a) Zero
b) Maximum at the surface
c) Equal to the electric field outside
d) Non-zero and uniform
Answer: a)

18. A charge is placed at the center of a spherical shell. The electric field outside the shell is:
a) Zero
b) Directly proportional to the charge
c) Inversely proportional to the distance from the center
d) A constant
Answer: b)

19. The electric flux through a surface is proportional to:
a) The charge enclosed within the surface
b) The area of the surface
c) The distance between the charges
d) The surface area and the electric field strength
Answer: a)

20. In electrostatics, the work done in moving a charge between two points depends on:
a) The path taken
b) The initial and final potentials
c) The distance traveled
d) The amount of charge moved
Answer: b)

21. The potential due to a point charge is:
a) Directly proportional to the distance
b) Inversely proportional to the distance
c) Constant throughout the space
d) Inversely proportional to the square of the distance
Answer: b)

22. The electric field due to a point charge at a distance r is:
a) Inversely proportional to r

b) Inversely proportional to r^2
c) Directly proportional to r
d) Constant for all distances
Answer: b)

23. If two charges have opposite signs, the force between them will be:
a) Attractive
b) Repulsive
c) Zero
d) Unpredictable
Answer: a)

24. The electric field lines due to a positive charge are:
a) Radially outward
b) Radially inward
c) Circular
d) Elliptical
Answer: a)

25. If the electric field intensity at a point is 5 N/C, the force experienced by a charge of 2 C at that point is:
a) 10 N
b) 2.5 N
c) 7 N
d) 5 N
Answer: a)

26. The potential difference between two points is 1 volt when 1 joule of work is done in moving 1 coulomb of charge. This statement is:
a) Correct
b) Incorrect
c) True for a parallel plate capacitor only
d) True for a battery only
Answer: a)

27. In electrostatics, a charge of +q placed at the center of a spherical shell produces:
a) No electric field
b) An electric field outside the shell
c) An electric field inside the shell

d) An electric field inside and outside the shell
Answer: b)

28. A charge of -2 C experiences a force of 8 N in an electric field. What is the field intensity?
a) 4 N/C
b) -4 N/C
c) 2 N/C
d) -2 N/C
Answer: a)

29. The potential energy of a charge in an electric field is:
a) Always positive
b) Always negative
c) Depends on the type of charge
d) Depends on the position of the charge
Answer: d)

30. What is the energy stored in a capacitor called?
a) Electric potential
b) Electrostatic potential energy
c) Electric field energy
d) Current energy
Answer: b)

31. The capacitance of a parallel plate capacitor depends on the:
a) Area of the plates and the distance between them
b) Charge on the plates
c) Electric field between the plates
d) All of the above
Answer: a)

32. In a capacitor, the energy stored is:
a) Directly proportional to the charge
b) Inversely proportional to the voltage
c) Directly proportional to the square of the voltage
d) Inversely proportional to the capacitance
Answer: c)

33. The electric field intensity at the surface of a conductor is:
a) Zero
b) Maximum
c) Zero at one point
d) Uniform
Answer: b)

34. The potential difference between two points is 10 V. If the work done in moving a charge of 2 C is:
a) 5 J
b) 10 J
c) 20 J
d) 50 J
Answer: c)

35. What is the relationship between potential and electric field?
a) The electric field is the gradient of potential
b) The potential is the gradient of the electric field
c) Electric field and potential are independent
d) Electric field and potential are directly proportional
Answer: a)