Electric Field and Electric Field Intensity

1. **What is the unit of electric field intensity?** a) Volt
   b) Newton
   c) Newton/Coulomb
   d) Coulomb/Volt
2. **The direction of electric field intensity at a point in space due to a positive charge is:** a) Away from the charge
   b) Towards the charge
   c) Tangential to the charge
   d) Perpendicular to the charge
3. **Which of the following best describes the electric field created by a uniformly charged spherical shell?** a) It is zero at all points inside the shell.
   b) It is constant inside the shell.
   c) It increases linearly with distance inside the shell.
   d) It is always directed radially inward.
4. **The electric field intensity at a distance of 2 meters from a point charge of 3 µC is 2 N/C. What is the electric field intensity at 4 meters from the same charge?** a) 0.5 N/C
   b) 1 N/C
   c) 2 N/C
   d) 8 N/C
5. **What is the electric field intensity due to a point charge of 10 µC at a distance of 0.1 meters? (Use Coulomb's constant k = 9 × 10^9 N·m²/C²)** a) 9×10^6 N/C
   b) 9×10^7 N/C
   c) 9×10^8 N/C
   d) 9×10^9 N/C
6. **The electric field intensity at a point in space is defined as:** a) The force per unit charge.
   b) The potential energy per unit charge.
   c) The work done per unit charge.
   d) The force experienced by a test charge divided by the charge.
7. **If the electric field at a point is directed towards a positive charge, then the charge at that point must be:** a) Positive
   b) Negative
   c) Zero
   d) None of the above
8. **What happens to the electric field intensity as the distance from a point charge is doubled?**
   a) It becomes four times smaller.
   b) It becomes half as strong.
   c) It becomes twice as strong.
   d) It remains the same.
9. **The electric field intensity due to a point charge is proportional to:** a) 1/r
   b) r²
   c) 1/r²
   d) r
10. **For two point charges, the net electric field at a point is:** a) The vector sum of the electric fields due to each charge.
    b) The scalar sum of the electric fields due to each charge.

c) The product of the fields due to each charge.
d) Zero if the charges are equal.

Electric Field Due to a Point Charge

11. **The electric field intensity due to a point charge is:** a) Constant at all points.
    b) Radially symmetric around the charge.
    c) Zero at all points.
    d) Always directed along the surface of the charge.
12. **What is the electric field intensity at a point 0.5 meters away from a 2 μC point charge? (Use Coulomb's constant k = 9 × 10^9 N·m²/C²)** a) 3.6×10^6 N/C
    b) 4.5×10^6 N/C
    c) 7.2×10^6 N/C
    d) 9.0×10^6 N/C
13. **The electric field intensity due to a point charge Q at a distance r from the charge is:** a) Inversely proportional to r
    b) Inversely proportional to r²
    c) Proportional to r
    d) Proportional to r²
14. **If the electric field intensity at a point is 5 N/C, and the distance from the charge is doubled, the new field intensity will be:** a) 2.5 N/C
    b) 5 N/C
    c) 10 N/C
    d) 20 N/C
15. **The force experienced by a point charge of 2 μC placed in an electric field of intensity 10 N/C is:** a) 20 μN
    b) 2 μN
    c) 5 μN
    d) 10 μN
16. **The electric field intensity at a point near a point charge is 5 N/C. If the charge is doubled and the distance is halved, the new electric field intensity will be:** a) 5 N/C
    b) 10 N/C
    c) 20 N/C
    d) 40 N/C
17. **In which of the following scenarios will the electric field intensity at a point be zero?** a) Two equal positive charges at a distance.
    b) A positive charge and a negative charge of the same magnitude.
    c) Two equal negative charges at a distance.
    d) The point is infinitely far away from any charge.
18. **A point charge Q is placed at the origin. The electric field intensity at a point on the x-axis at a distance r from the origin is:** a) Zero
    b) $Q/4\pi\epsilon_0 r^2$
    c) $Q/2\pi\epsilon_0 r^2$
    d) $Q/4\pi r^2$

Electric Field and Electric Field Intensity

19. **A point charge of 3 µC is placed at the origin. What is the electric field intensity at a point located 1 meter along the x-axis?** a) 9×10^9 N/C
    b) 9×10^6 N/C
    c) 9×10^3 N/C
    d) 9×10^7 N/C
20. **If a charge of +5 µC produces an electric field intensity of 1 N/C at a distance of 2 meters, what would be the electric field intensity at 4 meters?** a) 0.25 N/C
    b) 0.5 N/C
    c) 1 N/C
    d) 4 N/C

Advanced Conceptual and Calculation-Based Questions

21. **The electric field intensity at a point near a positive charge is:** a) Zero
    b) Always directed inward
    c) Always directed outward
    d) Depends on the distance
22. **The electric field intensity at the surface of a charged conductor is:** a) Zero
    b) Maximum at the edges
    c) Uniform across the surface
    d) Inversely proportional to the radius of curvature
23. **What is the electric field at a point 1 meter away from a point charge of 1 µC?** a) 9×10^9 N/C
    b) 9×10^6 N/C
    c) 9×10^3 N/C
    d) 9×10^7 N/C
24. **If the electric field intensity is directly proportional to the charge Q and inversely proportional to the square of the distance r, the equation for the electric field intensity is:**
    a) $E = kQ/r$
    b) $E = kQ/r^2$
    c) $E = kQ^2/r$
    d) $E = kQ^2/r^2$
25. **If a negative charge is placed in a uniform electric field, the direction of the electric field intensity is:** a) Away from the negative charge
    b) Toward the negative charge
    c) Perpendicular to the negative charge
    d) Along the line joining the negative charge to the source
26. **The electric field intensity at a point 0.5 meters away from a point charge is 8 N/C. If the charge is doubled, the electric field intensity will become:** a) 16 N/C
    b) 4 N/C
    c) 2 N/C
    d) 1 N/C
27. **The electric field due to a uniformly charged ring at a point on its axis is:** a) Zero
    b) Radial

c) Constant
d) Varies with distance

28. **If a point charge Q creates an electric field E at a point, then at a distance of 2r from the charge, the electric field intensity will be:** a) E
b) 2E
c) E/4
d) E/2

29. **The electric field due to a uniformly charged infinite sheet of charge is:** a) Zero
b) Constant in magnitude
c) Zero inside and outside
d) Varies with distance

30. **The force on a charge placed in an electric field is given by F = qE. If the electric field intensity is halved, the force experienced by a charge will:** a) Remain the same
b) Double
c) Be halved
d) Become zero

Special Scenarios

31. **At the midpoint between two equal but opposite charges, the electric field intensity is:** a) Zero
b) Equal to the field of one charge
c) Twice the field of one charge
d) None of the above

32. **For two point charges, one positive and one negative, placed in a vacuum, the electric field at a point midway between the charges is:** a) Zero
b) Positive
c) Negative
d) None of the above

33. **In a region where a uniform electric field exists, the electric field lines are:** a) Radial
b) Parallel and equidistant
c) Curved
d) Inward and outward

34. **At a point 2 meters away from a point charge, the electric field intensity is 4 N/C. If the distance is reduced to 1 meter, the electric field intensity will be:** a) 8 N/C
b) 16 N/C
c) 4 N/C
d) 2 N/C

35. **The electric field intensity inside a hollow conductor is:** a) Zero
b) Maximum
c) Dependent on the charge on the conductor
d) None of the above

36. **The electric field intensity at a point near an isolated positive charge behaves in which manner?** a) It decreases as 1/r

b) It increases as 1/r
c) It decreases as 1/r²
d) It remains constant

37. **What is the potential due to a point charge at a distance r from the charge?** a) Directly proportional to r
b) Inversely proportional to r
c) Inversely proportional to r²
d) Constant

38. **The electric field intensity due to a dipole at a point along the axial line is:** a) Zero
b) Proportional to 1/r²
c) Proportional to 1/r³
d) Constant

39. **The electric field intensity at the surface of a charged sphere is:** a) Zero
b) Directly proportional to the radius of the sphere
c) Inversely proportional to the radius of the sphere
d) Constant for all radii

40. **If a charge is placed in an electric field, the electric field exerts a force on the charge, causing it to:** a) Move in the direction of the field
b) Move in the opposite direction of the field
c) Stay stationary
d) Move randomly

Calculation and Theory Combined

41. **The electric field intensity at a point 3 meters away from a 6 µC charge is:** a) 6 × 10^3 N/C
b) 6 × 10^6 N/C
c) 6 × 10^9 N/C
d) 3 × 10^3 N/C

42. **The force on a test charge in an electric field is:** a) Inversely proportional to the distance
b) Directly proportional to the distance
c) Zero if the charge is neutral
d) Directly proportional to the charge of the test particle

43. **The electric field intensity in a region is constant. The potential difference between two points in the region is:** a) Zero
b) Constant
c) Dependent on the distance between the points
d) Proportional to the square of the distance

44. **In a uniform electric field, the field lines are:** a) Radial and equidistant
b) Parallel and equidistant
c) Curved and random
d) Concentric circles

45. **A charge experiences a force of 10 N in an electric field. If the charge is doubled, the force on the charge will be:** a) 10 N
b) 20 N

    c) 5 N

    d) 0 N

46. **The electric field intensity due to a point charge in a vacuum is inversely proportional to:**
    a) Distance
    b) The square of the distance
    c) The cube of the distance
    d) None of the above

47. **Which of the following factors does NOT affect the electric field due to a point charge?** a)
    The charge value
    b) The distance from the charge
    c) The presence of other charges nearby
    d) The medium in which the field is present

48. **The electric field intensity due to a point charge at a distance of 3 meters is 6 N/C. What is the intensity at 6 meters?** a) 1.5 N/C
    b) 3 N/C
    c) 12 N/C
    d) 18 N/C

49. **The electric field intensity at a point in space is the:** a) Net force on a test charge divided by the charge
    b) Net force on a charge
    c) Force on the charge divided by its distance from the source
    d) None of the above

50. **The direction of the electric field intensity at a point is:** a) Radial
    b) Inward or outward depending on the charge
    c) Perpendicular to the surface of a conductor
    d) All of the above