📘 DPP – 1 (Electric Potential Basics + Potential due to Point Charge)

A. MCQ (20 Questions)

1. Electric potential at a point is defined as:
   (A) Work done per unit charge
   (B) Charge per unit work
   (C) Force per unit charge
   (D) None

2. SI unit of electric potential is:
   (A) Volt
   (B) Newton
   (C) Joule
   (D) Coulomb

3. The potential at a distance r from a charge q is:
   (A) kq/r
   (B) kq/r^2
   (C) kr/q
   (D) qr/k

4. Electric potential is a:
   (A) Vector
   (B) Scalar
   (C) Tensor
   (D) None

5. If r increases, electric potential:
   (A) increases
   (B) decreases
   (C) becomes zero
   (D) infinite

6. Potential due to a negative charge is:
   (A) positive
   (B) negative
   (C) zero
   (D) none

7. Work done in moving a charge on an equipotential surface is:
   (A) zero
   (B) maximum
   (C) minimum
   (D) constant

8. Equipotential surfaces are always _____ to electric field lines.
   (A) parallel
   (B) perpendicular
   (C) at 45°
   (D) cannot say

9. Electric potential inside a conductor is:
   (A) zero

(B) constant
(C) infinite
(D) equal to charge

10. Electric field and potential are related as: **(PYQ 2022A)**
    (A) $E=-dV/dr$
    (B) $E=dV/dr$
    (C) $E=V/r$
    (D) $E=Vr$

11. Potential due to electric dipole varies as:
    (A) $1/r$
    (B) $1/r^2$
    (C) $1/r^3$
    (D) r^2

12. Potential energy of two charges is given by:
    (A) $U=kq_1q_2/r$
    (B) $U=q_1q_2/r^2$
    (C) $U=kr/q$
    (D) None

13. Dimensional formula of V is: **(PYQ 2022A)**
    (A) $ML^2T^{-3}A^{-1}$
    (B) MLT^{-2}
    (C) MT^{-3}
    (D) $M^{-1}LT^2$

14. Potential at infinity from a point charge is usually taken as:
    (A) infinite
    (B) 1
    (C) zero
    (D) negative

15. Work needed to bring +q from ∞ to a charge +Q is:
    (A) positive
    (B) negative
    (C) zero
    (D) infinite

16. Electric potential difference is also known as:
    (A) emf
    (B) flux
    (C) charge density
    (D) none

17. SI unit of potential energy
    (A) Joule
    (B) Volt
    (C) Newton
    (D) Coulomb

18. Equipotential surfaces: **(PYQ 2018A)**
    (A) never intersect
    (B) always intersect

(C) sometimes intersect
(D) none

19. If potential at point A is +10 V and at B is 0 V, then work done in moving 2C from A to B is:
    (A) 20 J
    (B) −20 J
    (C) 10 J
    (D) zero

20. Electric potential inside a hollow conductor is:
    (A) zero
    (B) positive
    (C) constant
    (D) infinite

B. Short Answer Questions (5 Questions)

1. Define electric potential. Write its SI unit.

2. State relation between electric field and electric potential. (PYQ Term-1 2022)

3. What is equipotential surface? Write two properties. (PYQ 2018A)

4. Derive expression for potential due to a point charge.

5. What is potential difference? How is it measured?

C. Long Answer Questions (2 Questions)

1. Derive expression for electric potential at a point on the axial line of an electric dipole. (PYQ 2023A – concept)

2. Derive expression for electric potential energy of a system of two-point charges separated by distance r.