

★ ■ DPP – 3 (Capacitance Basics + Parallel Plate Capacitor + Dielectric Medium)

A. MCQ (20 Questions)

1. Capacitance of a capacitor is defined as:
(A) Q/V
(B) V/Q
(C) $Q \times V$
(D) $Q - V$
2. SI unit of capacitance is:
(A) Farad
(B) Henry
(C) Tesla
(D) Ohm
3. The capacitance of a parallel plate capacitor is:
(A) $C = \epsilon_0 A/d$
(B) $C = \epsilon_0 d/A$
(C) $C = A/\epsilon_0 d$
(D) $C = d/A$
4. If distance between plates is doubled, capacitance:
(A) halves
(B) doubles
(C) becomes zero
(D) 4 times decreases
5. Capacitance does NOT depend on: (PYQ Term-1 2022)
(A) area of plates
(B) distance between plates
(C) metal of plates
(D) medium between plates
6. If dielectric of constant k is inserted, C becomes: (PYQ 2014A)
(A) k times
(B) $1/k$ times
(C) unchanged
(D) infinite
7. Dielectric constant of metal is: (PYQ 2018A)
(A) infinite
(B) 10
(C) 0
(D) 1
8. When plate area increases, capacitance:
(A) increases
(B) decreases
(C) remains same
(D) becomes zero

9. If plates are pulled apart, capacitance:
(A) decreases
(B) increases
(C) constant
(D) none
10. The capacitance of parallel plate capacitor depends on: (PYQ 2024A)
(A) Area
(B) Distance
(C) Dielectric
(D) All of these
11. When dielectric slab completely fills the gap:
(A) $C=kC_0$
(B) $C=C_0/k$
(C) $C=C_0^2$
(D) none
12. Unit of dielectric constant is:
(A) no unit
(B) F
(C) C/m
(D) J/C
13. A capacitor stores:
(A) charge
(B) energy
(C) both
(D) none
14. Capacitance is a:
(A) scalar quantity
(B) vector quantity
(C) tensor
(D) none
15. Electric flux density D is equal to:
(A) ϵE
(B) E/ϵ
(C) q/V
(D) none
16. If area is doubled and distance halved, C becomes:
(A) 4C
(B) 2C
(C) C
(D) 8C
17. Capacitance of isolated conductor increases when:
(A) radius increases
(B) radius decreases
(C) q decreases
(D) none

18. If the potential difference increases, charge stored becomes:

- (A) more
- (B) less
- (C) same
- (D) zero

19. Electric field between plates is:

- (A) uniform
- (B) non-uniform
- (C) circular
- (D) zero

20. Capacitance is maximum for:

- (A) smallest d , largest A
 - (B) smallest A , largest d
 - (C) no dielectric
 - (D) vacuum only
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B. Short Questions (5 Questions)

1. Define capacitance.
 2. Write the formula for capacitance of a parallel plate capacitor. (PYQ 2023A – concept)
 3. What is dielectric constant? (PYQ 2014A / PYQ 2018A – concept)
 4. Explain how capacitance changes with distance between plates. (PYQ 2023A)
 5. Why is dielectric inserted in a capacitor?
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C. Long Questions (2 Questions)

1. Derive expression for capacitance of a Spherical capacitor.
2. Explain effect of dielectric medium on capacitance. Derive modified formula. (PYQ 2014A – concept)