Electromagnetic Waves-L1

1. A capacitor is connected across a battery, which delivers a current of $1\ \mathrm{A}$ at an instant in the capacitor. The displacement current through the capacitor at that instant is

   A. $1\ \mathrm{A}$

   B. $0\ \mathrm{A}$

   C. $2\ \mathrm{A}$

   D. $\frac{1}{2}\mathrm{A}$

2. A parallel-plate capacitor, with plate area A and separation between the plates d, is charged by a constant current i. Consider a plane surface of area $\frac{A}{2}$ parallel to the plates and drawn symmetrically between the plates. Find the displacement current through this area.

   A. $\frac{i}{4}$

   B. $\frac{i}{2}$

   C. i

   D. $Zero$

3. Assertion:

When a variable frequency AC source is connected to a capacitor, displacement current increases with increases in frequency.

Reason:

As frequency increases, conduction current also increases.

A. Both Assertion and Reason are correct, and Reason is the correct explanation for Assertion

B. Both Assertion and Reason are correct, but Reason is not the correct explanation for Assertion

C. Assertion is correct, but Reason is incorrect

D. Both Assertion and Reason are incorrect

4. Assertion : Kirchhoff's current law is valid at each plate of a capacitor carrying displacement current.

Reason : Magnitude of conduction current is equal to the magnitude of the displacement current.

A. Both assertion and reason are true, and reason is the correct explanation of assertion.

B. Both assertion and reason are true, but reason is not a correct explanation of assertion.

C. Assertion is true, but reason is false.

D. Assertion is false, but reason is true.

5. Displacement current goes through the gap between the plates of a capacitor when the charge of the capacitor -

A. increases non-linearly with time

B. decreases non-linearly with time

C. Both options (A) and (B)

D. is zero

1. (A)
2. (B)
3. (A)
4. (A)
5. (C)