Q.1 A capacitor is connected across a battery, which delivers a current of **1 A** at an instant in the capacitor. The displacement current through the capacitor at that instant is



Q.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.



Q.3 A parallel-plate capacitor is being charged. If I_D represents the displacement current between the plates of the capacitor and I_C represents the conduction current flowing in the connecting wire, then



Q.4 Displacement current is set up between the plates of a capacitor when the potential difference across the plates is



(A)Maximum	(B)Zero	(C)Minimum	(D)Varied with time
			(-)

Q.5 **100** Ω resistance and a capacitor of **100** Ω reactance are connected in series across a **220** V source. The peak value of the displacement current is



- Q.6 **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
- Q.7 Choose the correct answer from the alternatives given. The conduction current is the same as displacement current when the source is (A)AC Only (B)DC Only (C)Both AC and DC (D)neither AC nor for DC
- Q.8 A parallel plate capacitor with circular plates of radius **R** is being charged as shown. At the instant shown, the displacement current in the region between the plates enclosed between $\frac{R}{2}$ and **R** is given by,

$$(A)_{\frac{3}{4}}^{\frac{3}{4}}i$$
 $(B)_{\frac{1}{4}}^{\frac{1}{4}}$ $(C)_{3i}$ $(D)_{\frac{4}{3}}^{\frac{4}{3}}i$

- Q.9 To establish an instantaneous displacement current of magnitude i A in between the plates of a parallel plate capacitor of capacitance $\frac{1}{2}$ **F**, the value of $\frac{dV}{dt}$ is **(A)**2i **(B)** $\frac{i}{2}$ **(C)** $\frac{1}{2i}$
 - **(D)**i
- Q.10 A point charge is moving along a straight line with a constant velocityv. Consider a small area A perpendicular to the direction of motion of the charge. Calculate the displacement current through the area when its distance from the charge is \mathbf{x} . The value of \mathbf{x} is not large so that the electric field at any instant is essentially given by Coulomb's law.



ANSWER KEY

Q.	1	2	3	4	5	6	7	8	9	10
Sol.	(A)	(B)	(C)	(D)	(A)	(A)	(A)	(A)	(A)	(A)