Question paper

0	A parallel plate capacitor with plate area A and separation between the plates J, is charged by a constant current i. Consider a plane surface of area all parallel to the plates and drawn simultaneously between the plates. The displacement current through this area is A) i
	B) $i/2$
	c) $i/4$
	D) $i/8$
1	A parallel plate capacitor with plate area A and separation between the plates J, is charged by a constant current i. Consider a plane surface of area all parallel to the plates and drawn simultaneously between the plates. The displacement current through this area is A) i
	B) $i/2$
	C) $i/4$
	D) $i/8$
2	A parallel plate capacitor with plate area A and separation between the plates J, is charged by a constant current i. Consider a plane surface of area all parallel to the plates and drawn simultaneously between the plates. The displacement current through this area is A) i
	B) $i/2$
	C) $i/4$
	D) $i/8$
3	A parallel plate capacitor with plate area A and separation between the plates J, is charged by a constant current i. Consider a plane surface of area all parallel to the plates and drawn simultaneously between the plates. The displacement current through this area is A) i
	B) $i/2$
	c) $i/4$
	D) $i/8$
4	A parallel plate capacitor with plate area A and separation between the plates J, is charged by a constant current i. Consider a plane surface of area all parallel to the plates and drawn simultaneously between the plates. The displacement current through this area is A) i
	B) $i/2$
	C) $i/4$
	D) $i/8$

A parallel plate capacitor with plate area A and separation between the plates J, is charged by a constant current i. Consider a plane surface area all parallel to the plates and drawn simultaneously between the plates. The displacement current through this area is A) i
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A parallel plate capacitor with plate area A and separation between the plates J, is charged by a constant current i. Consider a plane surface area all parallel to the plates and drawn simultaneously between the plates. The displacement current through this area is A) i
B) $i/2$
C) $i/4$
D) $i/8$

Correct Answer: B 0

Solution:

[b] Charge on Capacitor plates at time t is, q=it Electric field between the plates at this instant.

$$\phi_E = \left(rac{A}{2}
ight)E = rac{it}{2arepsilon_0}$$
 Therefore, displacement current

$$E=rac{q}{Aarepsilon_0}=rac{it}{Aarepsilon_0}$$
 Electric flux $i_d=arepsilon_0rac{d\phi_E}{dt}=arepsilon_0rac{d}{dt}igg(rac{it}{2arepsilon_0}igg)=rac{i}{2}$

Correct Answer: B 1

Solution:

[b] Charge on Capacitor plates at time t is, q=it Electric field between the plates at this instant.

$$\phi_E = \left(rac{A}{2}
ight)E = rac{it}{2arepsilon_0}$$
 Therefore, displacement current

is at time t is, q=it Electric field between the plates at this instant.
$$E=\frac{q}{A\varepsilon_0}=\frac{it}{A\varepsilon_0} \text{ Electric flux}$$

$$\phi_E=\left(\frac{A}{2}\right)E=\frac{it}{2\varepsilon_0} \text{ Therefore, displacement current} \qquad i_d=\varepsilon_0\frac{d\phi_E}{dt}=\varepsilon_0\frac{d}{dt}\left(\frac{it}{2\varepsilon_0}\right)=\frac{i}{2}$$

Correct Answer: B

2 Solution:

[b] Charge on Capacitor plates at time t is, q=it Electric field between the plates at this instant.

$$\phi_E = \left(rac{A}{2}
ight)E = rac{it}{2arepsilon_0}$$
 Therefore, displacement current

$$E=rac{q}{Aarepsilon_0}=rac{it}{Aarepsilon_0}$$
 Electric flux $i_d=arepsilon_0rac{d\phi_E}{dt}=arepsilon_0rac{d}{dt}igg(rac{it}{2arepsilon_0}igg)=rac{i}{2}$

Correct Answer: B 3

Solution:

[b] Charge on Capacitor plates at time t is, q=it Electric field between the plates at this instant.

$$\phi_E = \left(rac{A}{2}
ight)E = rac{it}{2arepsilon_0}$$
 Therefore, displacement current $i_d = arepsilon_0rac{d\phi_E}{dt} = arepsilon_0rac{d}{dt}igg(rac{it}{2arepsilon_0}igg) = rac{i}{2}$

$$E=rac{q}{Aarepsilon_0}=rac{it}{Aarepsilon_0}$$
 Electric flux $i_d=arepsilon_0rac{d\phi_E}{dt}=arepsilon_0rac{d}{dt}igg(rac{it}{2arepsilon_0}igg)=rac{i}{2}$

Correct Answer: B

Solution:

4

5

[b] Charge on Capacitor plates at time t is, q=it Electric field between the plates at this instant.

$$\phi_E = \left(rac{A}{2}
ight)E = rac{it}{2arepsilon_0}$$
 Therefore, displacement current $i_d = arepsilon_0 rac{Aarepsilon_0}{dt} = rac{Aarepsilon_0}{dt} \left(rac{it}{2arepsilon_0}
ight) = rac{i}{2}$

$$E=rac{q}{Aarepsilon_0}=rac{it}{Aarepsilon_0}$$
 Electric flux $i_d=arepsilon_0rac{d\phi_E}{dt}=arepsilon_0rac{d}{dt}igg(rac{it}{2arepsilon_0}igg)=rac{i}{2}$

Correct Answer: B

Solution:

[b] Charge on Capacitor plates at time t is, q=it Electric field between the plates at this instant.

$$\phi_E = \left(rac{A}{2}
ight)E = rac{it}{2arepsilon_0}$$
 Therefore, displacement current

$$E=rac{q}{Aarepsilon_0}=rac{it}{Aarepsilon_0}$$
 Electric flux $i_d=arepsilon_0rac{d\phi_E}{dt}=arepsilon_0rac{d}{dt}igg(rac{it}{2arepsilon_0}igg)=rac{i}{2}$

Correct Answer: B 6 Solution:

[b] Charge on Capacitor plates at time t is, q=it Electric field between the plates at this instant.

through the given area
$$\phi_E=\left(rac{A}{2}
ight)E=rac{it}{2arepsilon_0}$$
 Therefore, displacement current

$$E=rac{q}{Aarepsilon_0}=rac{it}{Aarepsilon_0}$$
 Electric flux $i_d=arepsilon_0rac{d\phi_E}{dt}=arepsilon_0rac{d}{dt}igg(rac{it}{2arepsilon_0}igg)=rac{i}{2}$

Correct Answer: B 7

Solution:

[b] Charge on Capacitor plates at time t is, q=it Electric field between the plates at this instant.

through the given area
$$\phi_E=\left(rac{A}{2}
ight)E=rac{it}{2arepsilon_0}$$
 Therefore, displacement current

ant.
$$E=rac{q}{Aarepsilon_0}=rac{it}{Aarepsilon_0}$$
 Electric flux $i_d=arepsilon_0rac{d\phi_E}{dt}=arepsilon_0rac{d}{dt}igg(rac{it}{2arepsilon_0}igg)=rac{i}{2}$

Correct Answer: B

8 Solution:

[b] Charge on Capacitor plates at time t is, q=it Electric field between the plates at this instant.

$$\phi_E = \left(rac{A}{2}
ight)E = rac{it}{2arepsilon_0}$$
 Therefore, displacement current

$$E=rac{q}{Aarepsilon_0}=rac{it}{Aarepsilon_0}$$
 Electric flux $i_d=arepsilon_0rac{d\phi_E}{dt}=arepsilon_0rac{d}{dt}igg(rac{it}{2arepsilon_0}igg)=rac{i}{2}$

Correct Answer: B

Solution:

9

[b] Charge on Capacitor plates at time t is, q=it Electric field between the plates at this instant.

$$\phi_E = \left(rac{A}{2}
ight)E = rac{it}{2arepsilon_0}$$
 Therefore, displacement current $i_d = arepsilon_0rac{d\phi_E}{dt} = arepsilon_0rac{d}{dt}igg(rac{it}{2arepsilon_0}igg) = rac{i}{2}$

$$E=rac{q}{Aarepsilon_0}=rac{it}{Aarepsilon_0}$$
 Electric flux $i_d=arepsilon_0rac{d\phi_E}{dt}=arepsilon_0rac{d}{dt}igg(rac{it}{2arepsilon_0}igg)=rac{i}{2}$