

Electric Charges and Fields

NEET previous year questions · Physics

2 questions from the official papers: Re-NEET 2026 (1), NEET 2020 (1). Each is followed by its answer and a worked solution written by BrainIt. Generated on 23 October 2026.



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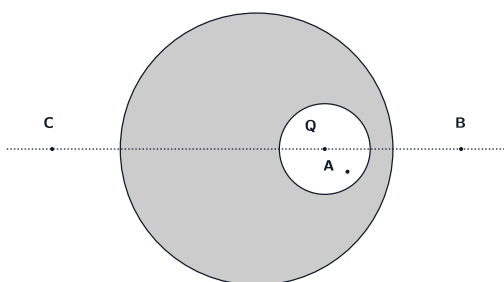
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1. Re-NEET 2026 · Q33

A point charge Q is placed inside a cavity within a solid isolated conducting sphere. Consider points A , B and C as shown in the figure, where the magnitudes of the electric fields are E_A , E_B , E_C , respectively. The points B and C are at the same distance from the center of the solid sphere. The correct option is :



- (1) $E_A = 0$, $E_B = E_C$ (2) $E_A \neq 0$, $E_B = E_C$
 (3) $E_A = 0$, $E_B > E_C$ (4) $E_A \neq 0$, $E_B < E_C$

Answer (2)

Sol. Point A lies in the empty cavity, not in the conducting material, so the field of Q is fully present there and $E_A \neq 0$. The induced $-Q$ on the cavity wall and $+Q$ on the outer surface arrange themselves so that the outer surface charge is UNIFORM regardless of where the cavity sits, so outside the sphere the field is exactly that of a point charge Q at the centre. Since B and C are equidistant from that centre, $E_B = E_C$.
 NCERT Class 12, Electric Charges and Fields (electrostatics of conductors).

Why the other options are wrong:

- (1) confuses the cavity with the conducting material
- the field vanishes inside the METAL, not inside the hollow
- (3) combines the cavity error with the idea that the off-centre cavity biases the external field towards B

- (4) correctly sees $E_A \neq 0$ but wrongly assumes the external field is skewed away from the cavity side

2. NEET 2020 · Q170

A spherical conductor of radius 10 cm has a charge of 3.2×10^{-7} C distributed uniformly. What is the magnitude of electric field at a point 15 cm from the centre of the sphere? ($1/(4\pi\epsilon_0) = 9 \times 10^9$ N m² C⁻²)

- (1) 1.28×10^5 N C⁻¹ (2) 1.28×10^6 N C⁻¹
 (3) 1.28×10^7 N C⁻¹ (4) 1.28×10^4 N C⁻¹

Answer (1)

Sol. The electric field outside a charged spherical conductor is given by $E = \frac{1}{4\pi\epsilon_0} \frac{Q}{r^2}$. Substituting the values, $E = 9 \times 10^9 \times \frac{3.2 \times 10^{-7}}{(0.15)^2} = 1.28 \times 10^5$ N/C.
 Chapter: Electric Charges and Fields.

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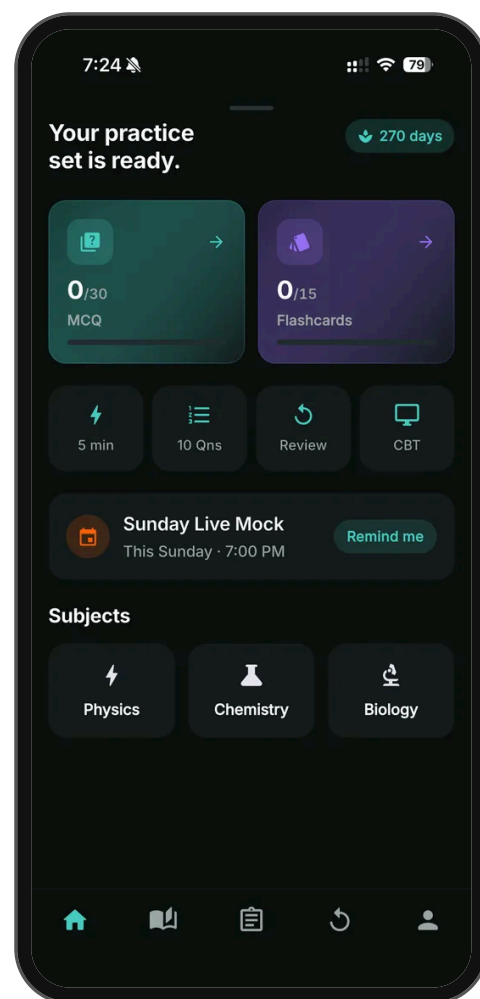
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