

PART 1 - PHYSICS

Topic : Electric charges and fields

SECTION-A : (Maximum Marks : 4)

- This section contains **ONE** question.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONLY ONE** of these four options is the correct answer.
- For each question, choose the option corresponding to the correct answer.
- Answer to each question will be evaluated according to the following marking scheme :
 Full Marks : +4 If **ONLY** the correct option is chosen;
 Zero Marks : 0 If none of the options is chosen (i.e. the question is unanswered);
 Negative Marks : -1 In all other cases.

1. Two co-axial conducting cylinders of same length ℓ with radii $\sqrt{2}R$ and $2R$ are kept, as shown in Fig. 1. The charge on the inner cylinder is Q and the outer cylinder is grounded. The annular region between the cylinders is filled with a material of dielectric constant $\kappa = 5$. Consider an imaginary plane of the same length ℓ at a distance R from the common axis of the cylinders. This plane is parallel to the axis of the cylinders. The cross-sectional view of this arrangement is shown in Fig. 2. Ignoring edge effects, the flux of the electric field through the plane is (ϵ_0 is the permittivity of free space): [JEE Advanced 2025 Paper 2]

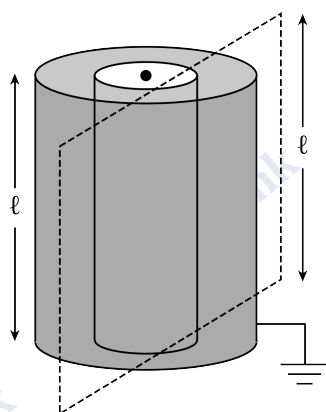


Fig. 1

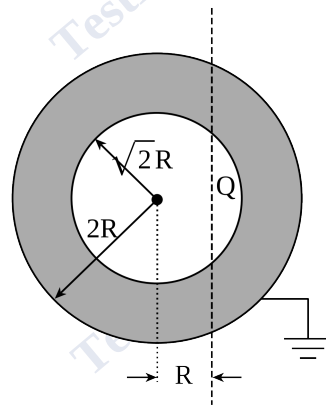


Fig. 2

(A) $\frac{Q}{30\epsilon_0}$

(B) $\frac{Q}{15\epsilon_0}$

(C) $\frac{Q}{60\epsilon_0}$

(D) $\frac{Q}{120\epsilon_0}$

Scan or tap for the full solution



Space for Rough Work

JEE ADVANCED ELECTRIC CHARGES AND FIELDS —
ELECTRIC FLUX — PYQS

Test Pattern : JEE (Advanced)

ANSWER KEY

SECTION-A																									
Ques.	1																								
Ans.	C																								