

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]

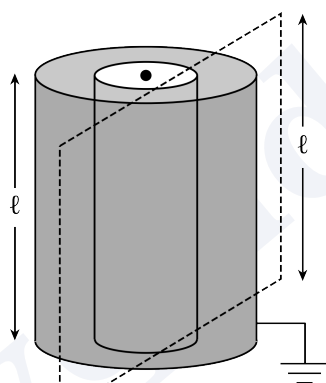


Fig. 1

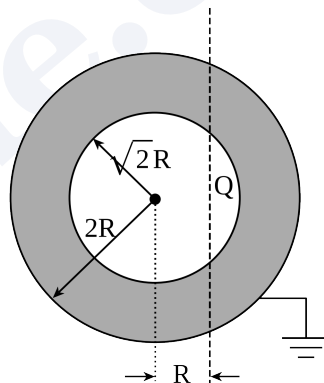


Fig. 2

(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																								