

# PART 1 - PHYSICS

**Topic :** Electrostatic potential and capacitance

## SECTION-A : (Maximum Marks : 4)

This section contains **ONE** question.

Each question has **TWO** lists: **List-I** and **List-II**.

Four options are given representing matching of elements from List-I and List-II. **ONLY ONE** of these four options corresponds to a correct matching.

For each question, choose the option corresponding to the correct answer.

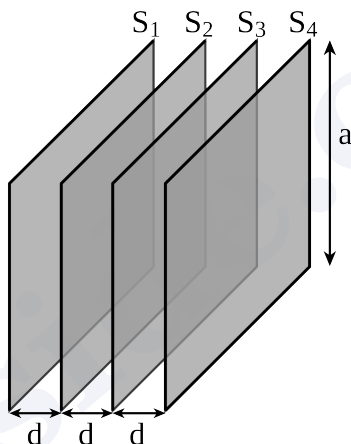
Answer to each question will be evaluated according to the following marking scheme :

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. Four identical thin, square metal sheets,  $S_1$ ,  $S_2$ ,  $S_3$  and  $S_4$ , each of side  $a$  are kept parallel to each other with equal distance  $d$  ( $\ll a$ ) between them, as shown in the figure. Let  $C_0 = \epsilon_0 a^2/d$ , where  $\epsilon_0$  is the permittivity of free space.



Match the quantities mentioned in **List-I** with their values in **List-II** and choose the correct option.

[JEE Advanced 2024 Paper 1]

| List-I |                                                                                                         | List-II |          |
|--------|---------------------------------------------------------------------------------------------------------|---------|----------|
| P.     | The capacitance between $S_1$ and $S_4$ , with $S_2$ and $S_3$ not connected, is                        | 1.      | $3C_0$   |
| Q.     | The capacitance between $S_1$ and $S_4$ , with $S_2$ shorted to $S_3$ , is                              | 2.      | $C_0/2$  |
| R.     | The capacitance between $S_1$ and $S_3$ , with $S_2$ shorted to $S_4$ , is                              | 3.      | $C_0/3$  |
| S.     | The capacitance between $S_1$ and $S_2$ , with $S_3$ shorted to $S_1$ , and $S_2$ shorted to $S_4$ , is | 4.      | $2C_0/3$ |
|        |                                                                                                         | 5.      | $2C_0$   |

**Space for Rough Work**

## PYQSide

(A)  $P \propto \rightarrow \propto 3$ ;  $Q \propto \rightarrow \propto 2$ ;  $R \propto \rightarrow \propto 4$ ;  $S \propto \rightarrow \propto 5$

(B)  $P \propto \rightarrow \propto 2$ ;  $Q \propto \rightarrow \propto 3$ ;  $R \propto \rightarrow \propto 2$ ;  $S \propto \rightarrow \propto 1$

(C)  $P \propto \rightarrow \propto 3$ ;  $Q \propto \rightarrow \propto 2$ ;  $R \propto \rightarrow \propto 4$ ;  $S \propto \rightarrow \propto 1$

(D)  $P \propto \rightarrow \propto 3$ ;  $Q \propto \rightarrow \propto 2$ ;  $R \propto \rightarrow \propto 2$ ;  $S \propto \rightarrow \propto 5$

Scan or tap for the  
full solution



pyqside.com

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JEE ADVANCED ELECTROSTATIC POTENTIAL AND CAPACITANCE — CAPACITORS AND CAPACITANCE, PARALLEL PLATE CAPACITOR — PYQS

Test Pattern : JEE (Advanced)

ANSWER KEY

| SECTION-A |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|-----------|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| Ques.     | 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Ans.      | C |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |