PART 1 - PHYSICS

Topic : Waves

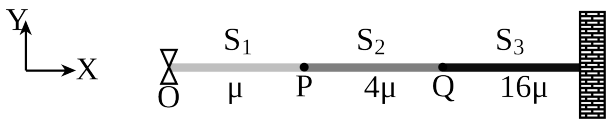
SECTION–1 : (Maximum Marks : 4)

- This section contains **ONE** question.
- Each question has **FOUR** options (A), (B), (C) and (D). **ONE OR MORE THAN ONE** of these four option(s) is(are) correct answer(s).
- For each question, choose the option(s) corresponding to (all) the correct answer(s).
- Answer to each question will be evaluated according to the following marking scheme :

Full Marks	: +4	ONLY if (all) the correct option(s) is(are) chosen;
Partial Marks	: +3	If all the four options are correct but ONLY three options are chosen;
Partial Marks	: +2	If three or more options are correct but ONLY two options are chosen, both of which are correct;
Partial Marks	: +1	If two or more options are correct but ONLY one option is chosen and it is a correct option;
Zero Marks	: 0	If none of the options is chosen (i.e. the question is unanswered);
Negative Marks	: −2	In all other cases.

- For example, in a question, if **(A), (B) and (D)** are the ONLY three options corresponding to correct answers, then choosing ONLY (A), (B) and (D) will get +4 marks; choosing ONLY (A) and (B) will get +2 marks; choosing ONLY (A) and (D) will get +2 marks; choosing ONLY (B) and (D) will get +2 marks; choosing ONLY (A) will get +1 mark; choosing ONLY (B) will get +1 mark; choosing ONLY (D) will get +1 mark; choosing no option (i.e. the question is unanswered) will get 0 marks; and choosing any other combination of options will get −2 marks.

1. Consider a system of three connected strings, S_1, S_2 and S_3 with uniform linear mass densities μ kg/m, 4μ kg/m and 16μ kg/m, respectively, as shown in the figure. S_1 and S_2 are connected at the point P, whereas S_2 and S_3 are connected at the point Q, and the other end of S_3 is connected to a wall. A wave generator O is connected to the free end of S_1. The wave from the generator is represented by $y = y_0\cos(\omega t - kx)$ cm, where y_0, ω and k are constants of appropriate dimensions. Which of the following statements is/are correct: [JEE Advanced 2025 Paper 1]



(A) When the wave reflects from P for the first time, the reflected wave is represented by $y = \alpha_1 y_0\cos(\omega t + kx + \pi)$ cm, where α_1 is a positive constant.

(B) When the wave transmits through P for the first time, the transmitted wave is represented by $y = \alpha_2 y_0\cos(\omega t - kx)$ cm, where α_2 is a positive constant.

(C) When the wave reflects from Q for the first time, the reflected wave is represented by $y = \alpha_3 y_0\cos(\omega t - kx + \pi)$ cm, where α_3 is a positive constant.

(D) When the wave transmits through Q for the first time, the transmitted wave is represented by $y = \alpha_4 y_0\cos(\omega t - 4kx)$ cm, where α_4 is a positive constant.

Scan or tap for the full solution

Space for Rough Work

PYQSide

TEST SERIES
(Academic Session : 2026-2027)

JEE ADVANCED WAVES — REFLECTION OF WAVES — PYQS

Test Pattern : **JEE (Advanced)**

ANSWER KEY

SECTION–1																									
Ques.	1																								
Ans.	**A, D**																								