

PART 1 - PHYSICS

Topic : Mechanical properties of fluids

SECTION-A : (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 : -1 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 -1 marks.

1. A table tennis ball has radius $(3/2) \times 10^{-2}$ m and mass $(22/7) \times 10^{-3}$ kg. It is slowly pushed down into a swimming pool to a depth of $d = 0.7$ m below the water surface and then released from rest. It emerges from the water surface at speed v , without getting wet, and rises up to a height H . Which of the following option(s) is(are) correct?

[Given: $\pi = 22/7$, $g = 10 \text{ m s}^{-2}$, density of water $= 1 \times 10^3 \text{ kg m}^{-3}$, viscosity of water $= 1 \times 10^{-3} \text{ Pa-s}$.] [JEE Advanced 2024 Paper 2]

- (A) The work done in pushing the ball to the depth d is 0.077 J.
 (B) If we neglect the viscous force in water, then the speed $v = 7 \text{ m/s}$.
 (C) If we neglect the viscous force in water, then the height $H = 1.4 \text{ m}$.
 (D) The ratio of the magnitudes of the net force excluding the viscous force to the maximum viscous force in water is 500/9.

Scan or tap for the
full solution



Space for Rough Work

JEE ADVANCED MECHANICAL PROPERTIES OF FLUIDS — VISCOSITY AND STOKES' LAW, TERMINAL VELOCITY — PYQS

Test Pattern : JEE (Advanced)

ANSWER KEY

SECTION-A

Ques.	1																
Ans.	A, B, D																