

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

Max. Marks: 28

Questions: 7

Section A (MCQ) — 5 questions

- Q.1** A spherical liquid drop of radius R acquires the terminal velocity v_1 when falls through a gas of viscosity η . Now the drop is broken into 64 identical droplets and each droplet acquires terminal velocity v_2 falling through the same gas. The ratio of terminal velocities v_1/v_2 is _____.

[JEE Main 2026 (Online) 8th April Evening Shift]

- (1) 4 (2) 0.25 (3) 32 (4) 16

Scan or tap for the full solution



- Q.2** If an air bubble of diameter 2 mm rises steadily through a liquid of density 2000 kg/m^3 at a rate of 0.5 cm/s , then the coefficient of viscosity of liquid is _____ Poise. (Take $g = 10 \text{ m/s}^2$)

[JEE Main 2026 (Online) 2nd April Evening Shift]

- (1) 0.88 (2) 8.8 (3) 88.8 (4) 0.088

Scan or tap for the full solution



- Q.3** A small metallic sphere of diameter 2 mm and density 10.5 g/cm^3 is dropped in glycerine having viscosity 10 Poise and density 1.5 g/cm^3 respectively. The terminal velocity attained by the sphere is _____ cm/s.

$$\left(\pi = \frac{22}{7} \text{ and } g = 10 \text{ m/s}^2\right)$$

[JEE Main 2026 (Online) 23rd January Evening Shift]

- (1) 1.0 (2) 1.5 (3) 3.0 (4) 2.0

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- Q.4** A solid steel ball of diameter 3.6 mm acquired terminal velocity $2.45 \times 10^{-2} \text{ m/s}$ while falling under gravity through an oil of density 925 kg m^{-3} . Take density of steel as 7825 kg m^{-3} and g as 9.8 m/s^2 . The viscosity of the oil in SI unit is

[JEE Main 2025 (Online) 3rd April Evening Shift]

- (1) 2.18 (2) 1.68 (3) 2.38 (4) 1.99

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- Q.5** Consider following statements:

- A. Surface tension arises due to extra energy of the molecules at the interior as compared to the molecules at the surface, of a liquid.

- B. As the temperature of liquid rises, the coefficient of viscosity increases.
 C. As the temperature of gas increases, the coefficient of viscosity increases.
 D. The onset of turbulence is determined by Reynolds number.
 E. In a steady flow two stream lines never intersect.
 Choose the correct answer from the options given below:

[JEE Main 2025 (Online) 28th January Morning Shift]

- (1) B, C, D Only (2) C, D, E Only
 (3) A, D, E Only (4) A, B, C Only

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Section B (Numerical) — 2 questions

- Q.6** Sixty four raindrops of radius 1 mm each falling down with a terminal velocity of 10 cm/s coalesce to form a bigger drop. The terminal velocity of bigger drop is _____ cm/s.

[JEE Main 2026 (Online) 24th January Morning Shift]

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- Q.7** The terminal velocity of a metallic ball of radius 6 mm in a viscous fluid is 20 cm/s . The terminal velocity of another ball of same material and having radius 3 mm in the same fluid will be _____ cm/s.

[JEE Main 2026 (Online) 21st January Evening Shift]

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ANSWER KEY

Section A (MCQ) — 5 questions

Ques.	1	2	3	4	5						
Ans.	4	2	4	4	2						

Section B (Numerical) — 2 questions

Ques.	6	7					
Ans.	160	5					