JEE Main PYQs on Fluid Mechanics: JEE Main Questions for Practice with Solutions

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The JEE Main Physics section requires speed and accuracy, along with a thorough understanding of the Fluid Mechanics. This article provides a set of JEE Main PYQs on Fluid Mechanics to help you understand the topic and improve your problem-solving skills with the help of detailed solutions by ensuring conceptual clarity, which will help you in the JEE Main 2026 preparation.

Whether you're revising the basics or testing your knowledge, these JEE Main PYQs will serve as a valuable practice resource.

The JEE Main 2026 exam is likely to continue on the same pattern as JEE Main 2025. Out of 90 questions, students can expect a fair mix from all three subjects. To get an edge, going through JEE Main previous year questions (PYQs) is one of the best strategies.

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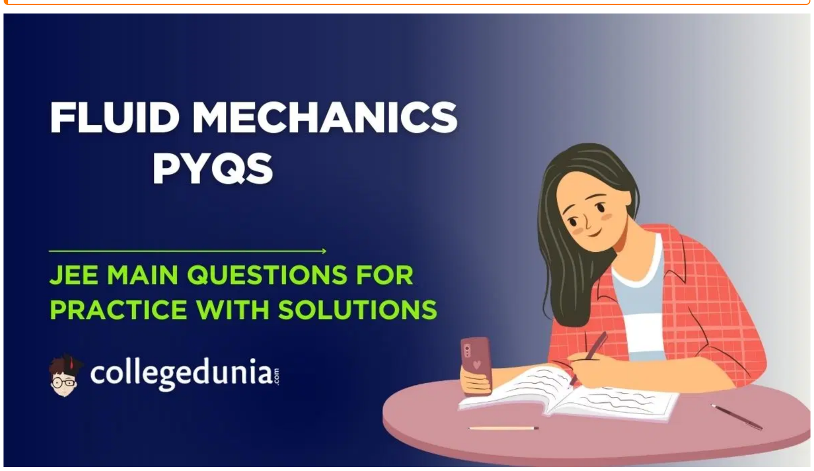
- JEE Main Exam Pattern
- JEE Main Question Paper



JEE Main PYQs on Fluid Mechanics

1. A small rigid spherical ball of mass M is dropped in a long vertical tube containing glycerine. The velocity of the ball becomes constant after some time. If the density of glycerine is half of the density of the ball, then the viscous force acting on the ball will be (consider g as acceleration due to gravity):

A. $2Mg$

B. Mg

C. $\frac{Mg}{2}$

D. $\frac{3Mg}{2}$

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JEE Main Question Paper
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2. **Two projectiles are fired with the same initial speed from the same point on the ground at angles of $(45^\circ - \alpha)$ and $(45^\circ + \alpha)$, respectively, with the horizontal direction. The ratio of their maximum heights attained is:**

A $\frac{1-\tan\alpha}{1+\tan\alpha}$

B $\frac{1-\sin 2\alpha}{1+\sin 2\alpha}$

C $\frac{1+\sin 2\alpha}{1-\sin 2\alpha}$

D $\frac{1+\sin\alpha}{1-\sin\alpha}$

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3. **The energy E and momentum p of a moving body of mass m are related by some equation. Given that c represents the speed of light, identify the correct equation:**

A $E^2 = p^2c^2 + m^2c^4$

B $E^2 = p^2c^2 + m^2c^4$

C $E^2 = pc^2 + m^2c^2$

D $E^2 = pc^2 + m^4c^4$

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4. **A body of mass m connected to a massless and unstretchable string goes in vertical circle of radius R under gravity g. The other end of the string is fixed at the center of the circle. If velocity at top of circular path is $v = \sqrt{ngR}$, where $n \geq 1$, then the ratio of kinetic energy of the body at bottom to that at top of the circle is:**

A $\frac{n^2}{n^2+4}$

B $\frac{n}{n+4}$

C $\frac{n+4}{n}$

D $\frac{n^2+4}{n^2}$

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5. **A proton of mass 'mp' has same energy as that of a photon of wavelength 'λ'. If the proton is moving at non-relativistic speed, then ratio of its de Broglie wavelength to the wavelength of photon is.**

A $\frac{1}{c}\sqrt{\frac{E}{2m_p}}$

B $\frac{1}{c\sqrt{m_p}}\frac{E}{\lambda}$

C $\frac{1}{2c\sqrt{m_p}}\frac{E}{\lambda}$

JEE Main PYQ

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D $\frac{1}{c\sqrt{2mp}}\frac{2E}{\lambda}$

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6. Two cylindrical vessels of equal cross-sectional area of $2\,\mathrm{m}^2$ contain water up to heights 10 m and 6 m, respectively. If the vessels are connected at their bottom, then the work done by the force of gravity is: (Density of water is $10^3\,\mathrm{kg/m}^3$ and $g = 10\,\mathrm{m/s}^2$)

A $1 \times 10^5\,\mathrm{J}$

B $4 \times 10^4\,\mathrm{J}$

C $6 \times 10^4\,\mathrm{J}$

D $8 \times 10^4\,\mathrm{J}$

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7. **Consider I_1 and I_2 are the currents flowing simultaneously in two nearby coils 1 & 2, respectively. If L_1 = self inductance of coil 1, M_{12} = mutual inductance of coil 1 with respect to coil 2, then the value of induced emf in coil 1 will be:**

A $e1 = -L1\frac{dI2}{dt} + M12\frac{dI1}{dt}$

B $e1 = -L1\frac{dI1}{dt} + M12\frac{dI2}{dt}$

C $e1 = -L1\frac{dI1}{dt} - M12\frac{dI2}{dt}$

D $e1 = -L1\frac{dI1}{dt} + M12\frac{dI1}{dt}$

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8. **Given below are two statements:**
Statement-I: The hot water flows faster than cold water.
Statement-II: Soap water has higher surface tension as compared to fresh water.
In the light of the above statements, choose the correct answer from the options given below:

A Statement-I is false but Statement II is true

B Statement-I is true but Statement II is false

C Both Statement-I and Statement-II are true

D Both Statement-I and Statement-II are false

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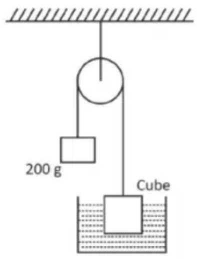
9. **A cube of side 10 cm is suspended from one end of a fine string of length 27 cm, and a mass of 200 grams is connected to the other end of the string. When the cube is half immersed in water, the**

system remains in balance. Find the density of the cube.



A 800 kg/m^3

B 500 kg/m^3

C 700 kg/m^3

D 600 kg/m^3

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10. **An electric dipole of mass m, charge q, and length l is placed in a uniform electric field $\mathbf{E} = E_0\hat{i}$. When the dipole is rotated slightly from its equilibrium position and released, the time period of its oscillations will be:**

A $2\pi\sqrt{\frac{ml}{qE0}}$

B $\frac{1}{2\pi}\sqrt{\frac{2ml}{qE0}}$

C $\frac{1}{2\pi}\sqrt{\frac{ml}{2qE0}}$

D $2\pi\sqrt{\frac{ml}{2qE0}}$

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11. **A proton of mass 'mp' has same energy as that of a photon of wavelength 'λ'. If the proton is moving at non-relativistic speed, then ratio of its de Broglie wavelength to the wavelength of photon is.**

A $\frac{1}{c\sqrt{2mp}}\frac{E}{\lambda}$

B $\frac{1}{c\sqrt{mp}}\frac{E}{\lambda}$

C $\frac{1}{2c\sqrt{mp}}\frac{E}{\lambda}$

D $\frac{1}{c\sqrt{2mp}}\frac{2E}{\lambda}$

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12. **In the experiment for measurement of viscosity η of a given liquid with a ball having radius R, consider following statements:**

A. Graph between terminal velocity V and R will be a parabola.

B. The terminal velocities of different diameter balls are constant for a given liquid.

C. Measurement of terminal velocity is dependent on the temperature.

D. This experiment can be utilized to assess the density of a given liquid.
E. If balls are dropped with some initial speed, the value of η will change.

A B, D and E Only

B C, D and E Only

C A, B and E Only

D A, C and D Only

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13. **Consider a completely full cylindrical water tank of height 1.6 m and cross-sectional area 0.5 m^2. It has a small hole in its side at a height 90 cm from the bottom. Assume, the cross-sectional area of the hole to be negligibly small as compared to that of the water tank. If a load 50 kg is applied at the top surface of the water in the tank then the velocity of the water coming out at the instant when the hole is opened is : (g = 10 m/s^2)**

A 3 m/s

B 5 m/s

C 2 m/s

D 4 m/s

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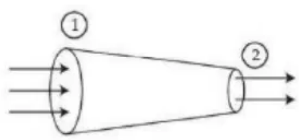
14. **A tube of length L is shown in the figure. The radius of cross section at point (1) is 2 cm and at the point (2) is 1 cm, respectively. If the velocity of water entering at point (1) is 2 m/s, then velocity of water leaving the point (2) will be:**



A 4 m/s

B 6 m/s

C 8 m/s

D 2 m/s

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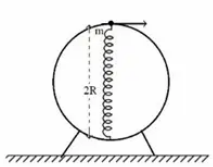
15. **A bead of mass m slides without friction on the wall of a vertical circular hoop of radius R as shown in figure. The bead moves under the combined action of gravity and a massless spring k attached to the bottom of the hoop. The equilibrium length of the spring is R. If the bead is released from the top of the hoop with (negligible) zero initial speed, the velocity of the bead, when the length of spring becomes R, would be (spring constant is k, g is acceleration due to gravity):**



A $\sqrt{\frac{3Rg+kR^2}{m}}$

B $\sqrt{\frac{2Rg+kR^2}{m}}$

C $\sqrt{\frac{2gR+kR^2}{m}}$

D $\sqrt{\frac{2Rg+4kR^2}{m}}$

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