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TARGET : NEET (UG) 2024

Course : SARANSH (Youtube Live CRASH COURSE)

PHYSICS
DPP
DAILY PRACTICE PROBLEMS
DPP NO. 1

PHYSICS: Elastcity and Viscosity

DPP No. : 1

1. A force F is needed to break a copper wire having radius R. The force needed to break a copper wire of radius 2 R will be :
(1) F/2 (2) 2 F (3) 4 F (4) F/4

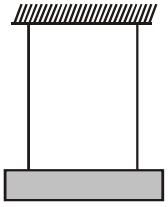
2. The fraction of a floating object of volume V_0 and density d_0 above the surface of a liquid of density d will be
(1) $\frac{d_0}{d}$ (2) $\frac{dd_0}{d+d_0}$ (3) $\frac{d-d_0}{d}$ (4) $\frac{dd_0}{d-d_0}$

3. Density of the ice is ρ and that of water is σ. What will be the decreasein volume when a mass M of ice melts.
(1) $\frac{M}{\sigma-\rho}$ (2) $\frac{\sigma-\rho}{M}$ (3) $M\left[\frac{1}{\rho}-\frac{1}{\sigma}\right]$ (4) $\frac{1}{M}\left[\frac{1}{\rho}-\frac{1}{\sigma}\right]$

4. The diameter of a brass rod is 4 mm and Young's modulus of brass is 9×10^{10} N/m^2. The force required to stretch by 0.1% of its length is :
(1) $360\,\pi$ N (2) 36 N (3) $144\,\pi \times 10^3$ N (4) $36\,\pi \times 10^5$ N

5. A steel wire is suspended vertically from a rigid support. When loaded with a weight in air, it expands by L_a and when the weight is immersed completely in water, the extension is reduced to L_w. Then relative density of the material of the weight is
(1) $\frac{L_a}{L_a-L_w}$ (2) $\frac{L_w}{L_a}$ (3) $\frac{L_a}{L_w}$ (4) $\frac{L_w}{L_a-L_w}$

6. Two wires of equal length and cross-section area suspended as shown in figure. Thier Young's modulus are Y_1 and Y_2 respectively. The equivalent Young's modulus will be



(1) $Y_1 + Y_2$ (2) $\frac{Y_1+Y_2}{2}$ (3) $\frac{Y_1Y_2}{Y_1+Y_2}$ (4) $\sqrt{Y_1 Y_2}$

7. A square brass plate of side 1.0 m and thickness 0.005 m is subjected to a force F on its smaller opposite edges, causing a displacement of 0.02 cm. If the shear modulus of brass is 0.4×10^{11} N/m^2, the value of the force F is

(1) 4×10^3 N (2) 400 N (3) 4×10^4 N (4) 1000 N

8. The terminal velocity of a sphere moving through a viscous medium is :

(1) directly proportional to the radius of the sphere

(2) inversely proportional to the radius of the sphere

(3) directly proportional to the square of the radius of sphere

(4) inversely proportional to the square of the radius of sphere

9. **Assertion :** Bulk modules of incompressible fluid is zero.

Reason : Bulk modulus of elasticity (K) represents $K = -\frac{\Delta V}{\Delta p/V}$, where symbols have their standard meaning.

Read the assertion and reason carefully to mark the correct option out of the options given below :

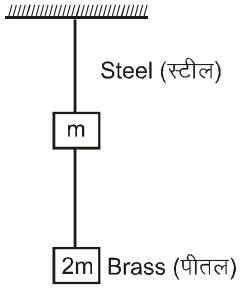
(1) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(2) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(3) If both assertion is true but reason is false.

(4) If the assertion and reason both are false.

10. If the ratio of lengths, radii and Young's modulii of steel and brass wires in the figure are a, b, c respectively. Then the corresponding ratio of increase in their lengths would be :



(1) $\frac{2ac}{b^2}$ (2) $\frac{3a}{2b^2c}$ (3) $\frac{3c}{2ab^2}$ (4) $\frac{2a^2c}{b}$