Assignment 6

The due date for submitting this assignment has passed. Due on 2019-03-13, 23:59 IST.

As per our records you have not submitted this assignment.

1) A mercury thread of length 1.5 cm, placed inside a capillary tube is of mass 25.6624 mg. The density of Hg is 13600 kg/m³. Find the approximate radius of the tube.

(a) 0.2 mm
(b) 0.3 mm
(c) 0.4 mm
(d) 0.5 mm

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a)

2) A tall metallic jar has a small hole of radius 0.07 mm at its bottom. What is the approximate depth up to which the jar can be lowered vertically in water before any water penetrates in through the hole? (Surface tension of water = 0.073 N/m):

(a) 7 cm
(b) 11 cm
(c) 16 cm
(d) 21 cm
3) When the angle of contact between solid and liquid is 90°

(a) Cohesive force > Adhesive force
(b) Cohesive force < Adhesive force
(c) Cohesive force = Adhesive force
(d) Cohesive force >> Adhesive force

No, the answer is incorrect.
Score: 0
Accepted Answers:
(c)

4) A circular solid of uniform thickness 20 mm, radius 200 mm and mass 20 kg, is used as a flywheel. If it rotates at 600 rpm, the kinetic energy of the flywheel, in joules is

(a) 395
(b) 790
(c) 1580
(d) 3160

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b)

5) For a liquid which rises in a capillary tube, the angle of contact is:

(a) 90°
(b) Acute angle
(c) Obtuse angle
(d) 180°

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b)
A flywheel weighs $10^4$ kg, and the whole of the weight may be considered as concentrated distance 1 m from the axis. What is the amount of energy stored in the flywheel when rotating at a speed of 100 revolutions per minute? ($\pi = 3.14$)

(a) $5.47 \times 10^5$ J
(b) $2.37 \times 10^7$ J
(c) $6.12 \times 10^8$ J
(d) $1.47 \times 10^3$ J

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a)

7) A flywheel, which can turn about a horizontal axis, is set in motion by a 500 gm weight hanging from a thin string that passes round the axle. After the wheel has made 5 revolutions, the string is detached from the axle and the weight drops off. The wheel then makes 7 revolutions before being brought to rest by friction. The radius of the axle is 2 cm, and at the instant when the weight drops off the angular velocity of the flywheel is 10 rad/s. Assume that the work done against friction in each revolution of the wheel is always the same. Calculate the moment of inertia of the flywheel about its axis of rotation. (Consider $\pi = 3.14$, $g = 9.8$ m/s$^2$)

(a) 0.0357 kg$\cdot$m$^2$
(b) 0.8511 kg$\cdot$m$^2$
(c) 1.7234 kg$\cdot$m$^2$
(d) 3.2548 kg$\cdot$m$^2$

No, the answer is incorrect.
Score: 0
Accepted Answers:
(a)

8)
A thin string is slipped on to a small peg on the axle of a flywheel and wound round it, with a mass kg suspended from its lower free end which is initially held in position at a height of 100 cm from the axle. The mass is then allowed to fall. When it just touches the floor and the string slips off the peg, the flywheel comes to rest after making 20 revolutions in 8 second. If the radius of the axle be 1 cm, obtain the moment of inertia of the flywheel about its axis of rotation. (Consider \( \pi = 3.14 \), \( g = 9.8 \text{ m/s}^2 \))

(a) 0.242 kg·m²
(b) 0.222 kg·m²
(c) 1.234 kg·m²
(d) 5.214 kg·m²

No, the answer is incorrect.
Score: 0
Accepted Answers:
(b)

9) If the surface tension of water is 0.07 Nm⁻¹, then the height to which it rises in a capillary tube of diameter 0.35 mm is nearly (consider angle of contact \( \theta = 0 \), \( g = 10 \text{ ms}^{-2} \) and density of water \( 10^3 \text{ kg/m}^3 \))

(a) 2 cm
(b) 4 cm
(c) 8 cm
(d) 9 cm

No, the answer is incorrect.
Score: 0
Accepted Answers:
(c)

10) Surface tension of the liquid depends on

(a) The area of surface of liquid
(b) Length of line considered
(c) The area of the surface and length of line considered
(d) The nature of liquid

Score: 1 point
11) Shape of the surface of a liquid in a tube is convex, if

(a) Cohesive forces between the molecules of the liquid are much stronger than the adhesive force

(b) Cohesive forces between the molecules of the liquid are much weaker than the adhesive forces

(c) The cohesive forces are absent

(d) The cohesive forces are as strong as adhesive force

No, the answer is incorrect.
Score: 0
Accepted Answers: (d)