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JAVA Comp. Applications
PYTHON Robotics & AI

St. Mary's Convent Inter College, Prayagraj
Second Unit Assessment –2024-25

Time : 1hr.   Class- 9   M.M. : 30

Physics

Name : ....   Roll No. ....   Date : ....

SECTION A [10]

Q1. Choose the correct answer from the options given below   **[5]**

1. Relative density of a substance is expressed by comparing the density of that substance with the density of:
   a) air   b) mercury   c) water   d) iron

2. **Assertion (A) :** A loaded ship is submerged more while an unloaded ship is submerged less.
   Reason (R) : A ship begins to be less submerged as it sails from sea water to river water.
   a) Both A and R are true   b) Both A and R are false
   c) A is false but R is true   d) A is true but R is false

3. A body weighed 'W' in air by a sensitive spring balance, will weigh .... in vacuum.
   a) the same   b) slightly more
   c) slightly less   d) zero

4. A body of weight 100 gf floats in a liquid. Its apparent weight will be
   a) Zero   b) 100 gf
   c) Less than 100 gf   d) More than 100 gf

5. The atmospheric pressure at earth surface is P_1 and inside mine is P_2. They are related as:
   a) $P_1 = P_2$ b) $P_1 < P_2$
   c) $P_1 > P_2$ d) $P_2 = 0$

Q2. 1. Write an expression for the pressure at a point inside a liquid. Explain the meaning of the symbols used.   [1]
   2. (a) Define one pascal (Pa), the S.I. unit of pressure.
      (b) How is the unit bar related to the S.I. unit pascal ?   [2]
   3. A piece of stone of mass 113 g sinks to the bottom in water contained in a measuring cylinder and water level in cylinder rises from 30 ml to 40 ml. Calculate R.D. of stone.   [2]

SECTION B [20]

Q3 1. What do the following indicate in a barometer regarding weather:
   a) Gradual fall in the mercury level
   b) Sudden rise in the mercury level
   c) Gradual rise in the mercury level

[P.T.O.]

2.   a)   An egg sinks in fresh water, but floats in a strong salt solution. Why?

b)   In a hydraulic jack as shown, mass of the car is 800 kg, $A_1=10$ cm^2, $A_2=10$ m^2. Calculate the minimum force F required to lift the car. [Take g=10 m/s^2]   [3]
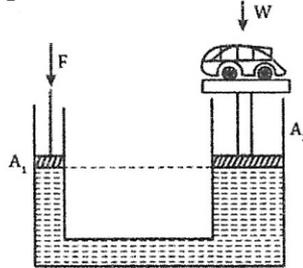
3.   A small stone of mass m(=200g) is held under water in a jar and is allowed to fall as shown in figure. The forces acting on stone are also shown.
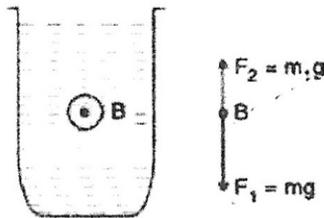
(i)   What does F_2 represent ?

(ii)   What does m_1 represent?

(iii)   Calculate the net force acting on stone.
Neglect the force due to viscosity. Assume that the volume of stone =80cm^3, density of water =1.0gcm^{-3} and g=10ms^{-2}.   [4]

Q4.   a)   Write three advantages of using mercury in a barometer.   [3]

b)   A body weighs 450gf in air and 310gf in water.
Find: (density of water= 1gm/cm^3)   [3]
i)   The upthrust on the body
ii)   The volume of the body
iii)   Relative density of the body

c)   Write the laws of liquid pressure.   [4]

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