CLASS 9 (CBSE) PT-4S Dt: 29/10/18

PHYSICS – SOLUTIONS

SECTION A

2 Iron has more density than water, so an iron nail placed on the surface of water, immediately sinks in it. However the density of iron is less than that of mercury. Therefore an iron nail floats on mercury.

3 Area = $0.5 m^2$

Pressure = 500 Pa

Force = ?

$$P = \frac{F}{A}$$

$$\Rightarrow 500 = \frac{F}{0.5}$$

$$\Rightarrow F = 500 \times 0.5$$

$$= \underline{250 N}$$

SECTION B

5. F = 550 N

Area of contact of one shoe

$= 160 cm^2$

$= 0.0160 m^2$

∴ Area of contact of 2 shoes

$= (2 \times 0.0160)\ m^2$

(a) Pressure when girl stands on one foot, $P = \frac{F}{A}$

$P = \frac{550}{0.0160} = 34375\ N/m^2$

$= \underline{34375\ Pa}$

(b) Pressure when girl stands on both feet, $P = \frac{F}{A}$

$P = \frac{550}{2 \times 0.0160} = 17187.5\ N/m^2$

$= \underline{17187.5\ Pa}$

6. (a) Newton's Universal Law of Gravitation – Every body in the universe attracts every other body with a force which is directly proportional to the product of their masses and inversely proportional to the square of the distance between them.

(b) SI unit of Universal Gravitational Constant G is – $\underline{Nm^2kg^{-2}}$

Its value is $\underline{6.673 \times 10^{-11}\ Nm^2kg^{-2}}$