Test Paper 3

1. State the law of floatation?
2. The blood pressure of humans is greater at the feet than at the brain?
3. Define surface tension?
4. State the angle of contact and on what values do the angle of contact depends?
5. Hydrostatic pressure is a scalar quantity even though pressure is force divided by area, and force is a vector. Explain?
6. Find the work done in blowing a soap bubble of surface tension 0.06 N/m from 2cm radius to 5cm radius?
7. Calculate the radius of new bubble formed when two bubbles of radius r_1 and r_2 coalesce?
8. A liquid drop of diameter 4 mm breaks into 1000 droplets of equal size. Calculate the resultant change in the surface energy. Surface tension of the liquid is 0.07 N/m?
9. State the principle on which Hydraulic lift work and explain its working?

Test Paper 5

1. Oil is sprinkled on sea waves to calm them. Why?
2. A drop of oil placed on the surface of water spreads out, but a drop of water placed on oil contracts. Why?
3. Water rises in a capillary tube but mercury falls in the same tube. Why?
4. What should be the pressure inside a small air bubble of 0.1mm radius situated just below the water surface? Surface tension of water = 7.2×10^{-2} N/m and atmospheric pressure = 1.013×10^5 N/m^2?
5. Why is a soap solution a better cleansing agent than ordinary water?
6. The antiseptics used for cuts and wounds in human flesh have low surface tension. Why?
7. If the radius of a soap bubble is r and surface tension of the soap solution is T. Keeping the temperature constant, what is the extra energy needed to double the radius of soap bubble?
8. Find the work done in breaking a water drop of radius 1 mm into 1000 drops. Given the surface tension of water is 72×10^{-3} N/m?
9. What is the energy stored in a soap babble of diameter 4 cm, given the surface tension = 0.07 N/m?
10. What is the work done in splitting a drop of water of 1 mm radius into 64 droplets? Given the surface tension of water is 72×10^{-3} N/m^2?
11. Why should detergents have small angles of contact?
12. Show that if two soap bubbles of radii a and b coalesce to from a single bubble of radius c. If the external pressure is P, show that the surface tension T of soap solution is $T = \dfrac{P\left(c^3 - a^3 - b^3\right)}{4\left(a^2 + b^2 - c^2\right)}$