

Section A

Question-1

- a. i) Write the names of two units of length smaller than a metre.
ii) Express the relationship of above mentioned units with metre. (2)
- b. Name the complementary fundamental quantities and state their S.I units. (2)
- c. i) Is 'speed' a fundamental quantity or a derived quantity?
ii) Name its SI unit. (2)
- d. Can the SI unit of force be written as 'Newton'? If not, give reason. (2)
- e. State the various fundamental quantities and units in i) C.G.S system
and ii) M.K.S system. (2)

Question-2

- a. i) Define thrust.
ii) State its S.I unit. (2)
- b. i) Define one pascal.
ii) How does the pressure inside a liquid change if the area of surface on which it acts is increased? (2)
- c. Why do sea divers need special protective suit. ? (2)
- d. Calculate the pressure due to water column of height 225cm.
(take $g=10 \text{ m/s}^2$ and density of water = 10^3 kg/m^3 .) (2)
- e. i) How does the pressure at a certain depth in sea water differ from that at the same depth in river water?
ii) Give reason for the above answer. (2)

Question-3

- a. State two factors which affect the atmospheric pressure as we go up. (2)
- b. Water does not run out of a dropper unless its rubber bulb is pressed.
Explain. (2)

- c. At sea level, the atmospheric pressure is 76cm of mercury. If air pressure falls by 1cm mercury per 110m ascent, what is the height of a hill where the barometer reads 68cm mercury?
- d. i) Write the numerical value of atmospheric pressure on the surface of the earth in pascal.
ii) We do not feel uneasy even under the enormous pressure of the atmosphere above as well as around us. Give reason.
- e. Why does nose start bleeding on high mountains?

Question-4

- a. What length of water column is equivalent to 0.76m of mercury column? Take density of mercury as $13.6 \times 10^3 \text{ kg/m}^3$ and density of water as 1000 kg/m^3 .
- b. Write any two advantages of Aneroid barometer over simple barometer.
- c. How is the reading of a barometer affected when it is taken to
i) a mine ii) a hill?
- d. A vessel contains water up to a height of 1.5m. Taking the density of water as 10^3 kg/m^3 , acceleration due to gravity as 9.8 m/s^2 and area of the base of the vessel as 80 cm^2 , calculate
i) the pressure and ii) the thrust at the base of the vessel.
- e. How does the pressure exerted by a solid and a fluid differ?

Section B (40 marks)

Question-5

- a. i) What is meant by the statement 'the atmospheric pressure at a place is 76cm of mercury?'
ii) Give three reasons for use of mercury as a barometric liquid.
- b. Mention the uses of a barometer.
- c. At sea level the atmospheric pressure is $1.04 \times 10^5 \text{ pa}$. Assuming $g=10 \text{ m/s}^2$ and density of air to be uniform and equal to 1.3 kg/m^3 , find the height of the atmosphere.