

# MECHANICAL PROPERTIES OF FLUIDS

**General Instructions:** Answer all the questions. If you are unable to answer any question, go through the page number that is given against that particular question in the text book. You can find the answer.

## Test Paper-II

**MAX MARKS: 30**

**TIME: 90Mts**

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|---|---|------|---|
| 1 | How does the atmospheric pressure values at the sea level help us in finding the approaching storm?   | P250 | 1 |
| 2 | At a depth of 1000m in an ocean<br>(a) What is the absolute pressure?<br>(b) What is the gauge pressure?<br>(c) Find the force acting on the window of area 20 cm X 20 cm of a submarine at this depth, the interior of which is maintained at sea-level atmospheric pressure. (The density of sea water is $1.03 \times 10^3 \text{ kg m}^{-3}$ , $g = 10 \text{ ms}^{-2}$ )   | P251 | 3 |
| 3 | Give the principle of working of Hydraulic Machines. Also explain with a neat diagram how hydraulic lift works.   | P251 | 3 |
| 4 | Two syringes of different cross sections filled with water are connected with a tightly fitted rubber tube filled with water. Diameters of the smaller piston and larger piston are 1.0 cm and 3.0cm respectively.<br>(a) Find the force exerted on the larger piston when the force of 10 N is applied to the smaller piston.<br>(b) If the smaller piston is pushed in through 6.0cm, how much does the larger piston move out? | P252 | 3 |
| 5 | In a car lift compressed air exerts a force $F_1$ on a small piston having a radius of 5.0 cm. This pressure is transmitted to a second piston of radius 15 cm. If the mass of the car to be lifted is 1350 kg, calculate $F_1$ . What is the pressure necessary to accomplish this task? ( $g = 9.8 \text{ ms}^{-2}$ )   | P253 | 3 |
| 6 | What is the principle & working of Hydraulic brakes?  | P253 | 3 |
| 7 | Define streamline flow of a fluid. Also give the properties of streamline flow of liquid.   | P253 | 3 |

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| 8  | Derive the equation of continuity. Also give the principle on which the equation depends upon.  | P253 | 3 |
| 9  | What are the differences between stream line flow and turbulent flow of a liquid?   | P253 | 2 |
| 10 | State and prove Bernoulli's theorem.  | P254 | 3 |
| 11 | Give the assumptions under which Bernoulli's principle is valid. Also state what happens to Bernoulli's equation when a fluid is at rest? | P255 | 2 |