MIDTERM MOCK TEST ANSWER PHY2

Test 1

Q1.

1. We have the equation of continuity:
2. By the Bernoulli equation, we have:

[Đề khúc này viết ko rõ, nên anh assume cái phần bên dưới là nước nha]

The differences in the pressure between the two locations is:

[Solve for using the above equations]

Q2

The length of the metal after the expansion is:

The change in temperature is:

Q3

1. The energy needed for the ice to reach melting point is:

The time it took for the ice to reach that temperature is:

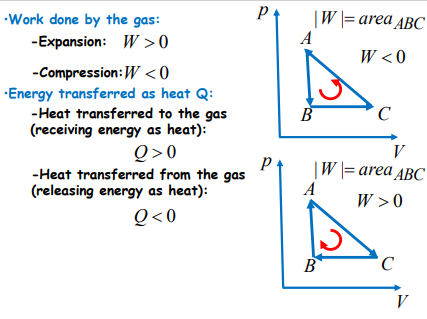
1. The ice must be melted completely for the temperature to rise above . The time needed for the ice to melt is:

The total time it takes is:

Q4.

1. The temperature difference across layer 1 is , then the temperature on the right of layer 1 should be. Therefore, we can calculate the temperature difference across layer 2 is:
2. We assume that the heat is transferred at steady state, so we have the equation:

Q5. Câu này tụi em tự nhớ mà làm chứ toàn lý thuyết ko



Test 2

Q1. We have the hydrostatic pressure at the height exactly under the oil layer is:

Solve for L

Q2. The area of each hole is: [remember the area formula, I don’t want to see this mistake in your midterm exam]

The area of the hose is:

The speed of the water leaving the holes is:

Q3. Assuming they only expand toward point A, each rod needs to expand 0.5 mm. We have the thermal expansion law:

The common temperature is:

Q4. The amount of heat need to melt 250 g of ice is:

The rate of heat transfer into the box is:

The thermal conductivity of the box is:

Q5.

The work done by the gas in AB is:

The work done by the gas in BA is:

The total work done by the gas is: =…

Test 3:

Q1.

We will consider the linear expansion of both the ball and the rod along the direction toward the ground.

Solve this to get

Q2.

Because the process is isobaric, the work done in expansion is:

The heat need to vaporize the water is:

The change in internal energy is:

Q3.

The total heat needed for the water to reach is:

The total heat is used on bringing the ice to melting temperature, melting the ice and bring the water to The amount of ice needed is:

Solve for m by yourself

Q4.

We have the Bernoulli equation:

With p1 is the pressure inside the hose and p2 is the atmospheric pressure and the density of water is , solve for v2.