NOBLE'19 PHY 103 EXAM PQ II

SECTION A
Question 1
Which of the following is the principle that guides the operation of a liquid-in-glass thermometer
(A)>> The expansion and contraction of liquid when there is a difference in temperature.
The expansion and contraction of liquid when there is a difference in thermal energy.
The change in conductivity of liquid under the influence of temperature.
The change in mass of liquid under the influence of temperature.
Question 2
Given the bulk modulus of a sample of water is 2.3x109 Pa, How much pressure in atm is needed to compress a sample of water by 0.1% (1 atm = 1.013x105 Pa)
(2)>>3x106 atm
(B)>> 2.27x101 atm

2.36x10-6 atm
2.27x10-1 atm
Question 3
A steel wire 1.3 mm2 in cross section supports a load of 10 kg and stretches by 2.87 mm. Taking the young's modulus of steel as 2.1x1011 Pa. What is its original length (Take g=9.8 ms-2).
(A)>> 8 m
8 mm
80 m
80 mm
Question 4
A steel rod 2.0 m long has across sectional area of 0.30 cm2. The rod is now hung by one end from a support structure, and a 550-kg milling machine is hung from the rod's lower end. Determine the strain of the rod
(A)>>9.0x10-4 m

9.0x104 m	
9.0x10-4	
9.0x104	
	Question 5
Strain can be measured in:	
N/m2	
N/m	
N· m	
(D)> it is unitless	
	QUESTION 6
Stress can be measured in:	
(a)> N/m2	

N·m2
N/m
N· m
Question 7
Evaluate the force required to punch a hole 1 cm in diameter in a steel sheet 3mm thick whose shearing strength is 2.76x108 Pa.
(A)>>2.6x104 N
2.6x104 Pa
2.4x106 N
2.4x106 Pa
QUESTION 8
From the figure shown below, Zeroth's law of equilibrium demands that

(A)>Vessel A is in thermal equilibrium with vessel B
Vessel B is in thermal equilibrium with vessel C
Vessel A is in thermal equilibrium with vessel C
All of the above
Question 9
Under adiabatic conditions, the bulk modulus is expressed as:
Question 10
Which of the following modulus of materials relates to change in shape of a material?
Bulk modulus
(b)> Young modulus
Shear modulus

Poisson modulus
SECTION B
SECTION B
Question 1
A non-viscous incompressible liquid is flowing through a horizontal pipe of constant cross section. Bernoulli's equation and the equation of continuity predict that the drop in pressure along the pipe:
is zero
depends on the length of the pip e
(b)> depends on the fluid velocity
describe an the corresponding describes
depends on the cross-sectional area of the pipe
Question 2
Engine oils are used as lubricants because of their
Low viscosity

Medium viscosity
Non viscosity
(D) High viscosity
Question 3
If the average velocity of water flowing through a pipe of diameter 10cm is 3cm/s. What is the velocity of water flowing out of a pipe of diameter 1cm?
0.3m/s
(b)>>30m/s
0.03m/s
3.0m/s
Question 4

The constant or uniform velocity attained by a body falling vertically through a viscous liquid is called

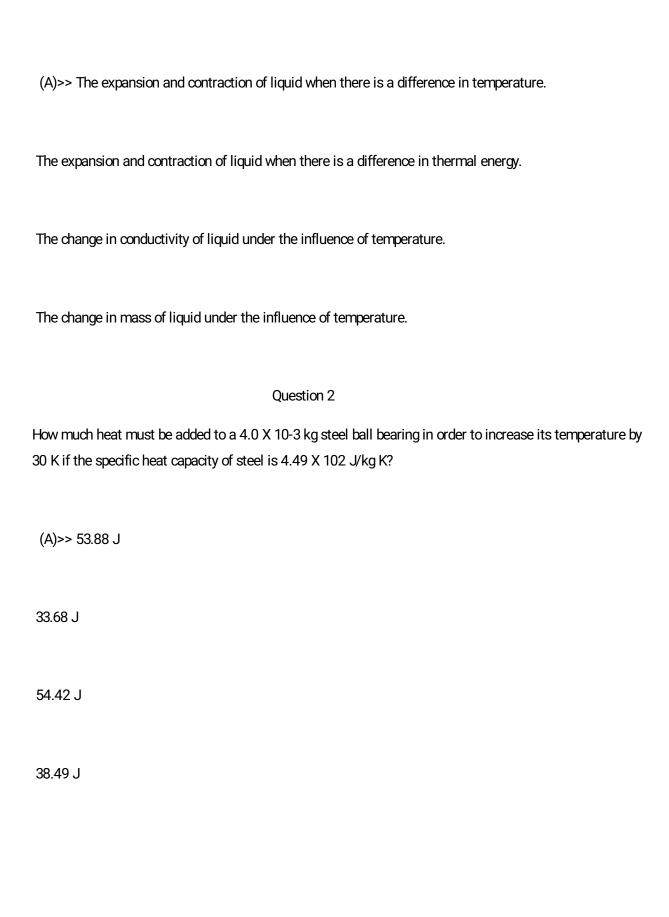
Average velocity
(B)>> Terminal velocity
Relative velocity
Instantaneous velocity
Question 5
Which of these statements are correct about streamline flow conditions for an ideal fluid? I. Fluid must be viscous II. Fluid must be incompressible III. Fluid motion must be steady IV. Fluid flow must be rotational
All
(B)>> II and III
I, II and III
II, III and IV

Bernoulli's equation can be derived from the conservation of:
(A)>> energy
mass
angular momentum
volume
OLIECTION 7
QUESTION 7 A person blows across the top of one arm of a U-tube partially filled with water. The water in that arm:
rises slightly
drops slightly
(C)>> remains at the same height
rises if the blowing is soft but drops if it is hard

A fluid is undergoing steady flow. Therefore:
the velocity of any given molecule of fluid does not change
the pressure does not vary from point to point
the velocity at any given point does not vary with time
(D)>> the density does not vary from point to point
Question 9
Atoms are made up of the following particles except
Protons
(B)>> Nucleons
Electrons

Neutrons
Question 10
Flow rate varies inversely wit viscosity is a statement of
(A)>>Poiseuilli's law
Avogadro's law
Bernoulli's equation
Pascal's law
SECTION C
Question 1

Liquid-in-glass thermometer operates based on



Which of the following about conduction is/are true?
1. Conduction can transfer thermal energy faster in denser medium. 2. Conduction cannot happen together
with convection 3. Conduction can transfer thermal energy faster through good electrical conductors
(A), 1 and Oanly
(A)>> 1 and 2only
1 and 3 only
2 and 3 only
1, 2 and 3 only
Question 4
The heat absorbed or released during a phase change is termed
Phase heat
crossover heat
(C)>>latent heat

heat capacity
Question 5
Gas turns to liquid by a process called
Vapourisation
freezing
(C)>> condensation
ionization Question 6
Which of the following can be done to increase the rate of cooking?
I. Use a black pot instead of silver pot.
III. Cover the pot with a lid.
1 and 2only
1 and 3 only
(C)>> 2 and 3 only

1,	2	an	d 3	on	ly
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What is Charles' law?

P1 V1 = P2 V2

(B)>>
$$V1 = V2 \times T1 \div T2$$

 $V1 = V2 \div T1 \times T2$

P1 V2 = P2 V1

Question 8

A ball of 4.0 X 10-3 kg was made of gold with specific capacity 1.29 X 102 J/kg K. By how much will the temperature of the ball change if heat energy of 53.88 J is applied?

(a)>> 104.4 K

27.8 K

59.17 K
57.5 K
Question 9
A heat of transformation of a substance is:
the energy absorbed as heat during a phase transformation
the energy per unit mass absorbed as heat during a phase transformation
(c)>> the same as the heat capacity
the same as the specific heat
Question 10
The kinetic energy of different particles at a particular time
Is constant

Differs from each other	
(c)>> Gradually increases	
Gradually decreases	
	SECTION D
Question 1 What happens to the less dense of two imm	niscible liquids?
It falls to the bottom	
It mixes	
(c)>> It rises to the top	
It remains on the same level	

Question 2 The vertical upward and downward movement of liquid in a tube is called Viscosity Cohesion (c)>>Capillarity Adhesion Question 3 A student standardizes the concentration of a saltwater solution by slowly adding salt until an egg will just float. The procedure is based on the assumption that: all eggs have the same volume

all eggs have the same weight

(c)>>all eggs have the same density

all eggs have the same shape
Question 4 A body with apparent weight of 102N has an upward force of 63N when immersed in water. Calculate the
real weight of the body
(A)>> 39N 25N
90N
165N
Ouestion 5

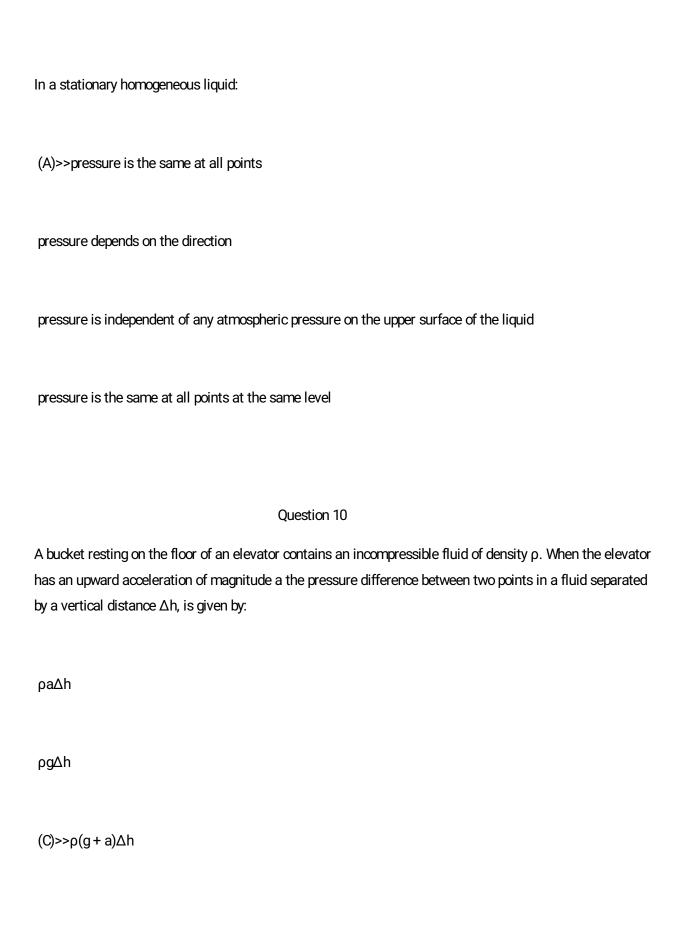
A 0.50-N metal sinker appears (as measured using a spring scale) to have a weight of 0.45 N when

submerged in water. The specific gravity of the metal is:

8
(c)>>9
10
Question 6
Which of the following factors affects the surface tension of a liquid?
Pressure
(B)>>Temperature
Volume
All of the above
Question 7

All fluids are:

gases
liquids
(c)>>gases or liquids
non-metallic
Question 8
Which of the following dimensional equation is a dimensional analysis of surface tension?
ML2T-2
MLT-2
ML2T-3
(D)>> MT-2



ρ(g - a)Δh

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