

PHYS 117 2021 Regular Midterm Exam (18524728)

Current Score:	0/9	Due:	Sat, Feb 27, 2021 11:35 AM CST								
Question	1	2	3	4	5	6	7	8	9	10	Total
Points	0	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/1	0/9

Description

This set of 1 statement of commitment to academic integrity and 9 questions is the midterm exam for PHYS 117 Winter 2021 at the University of Saskatchewan.

33% of the exam mark is based on the answers for the 6 multiple-choice questions submitted through WebAssign. All 6 questions are weighted equally.

67% of the exam mark is based on the answers (submitted through WebAssign) and solutions (submitted through Canvas) for the 3 word problems. All 3 word problems are weighted equally.

Instructions

Answers for **all** questions must be submitted in WebAssign.

For each of questions 8 through 10, in addition to submitting your answers in WebAssign, write the complete solution, **including a diagram**, using the problem-solving method discussed in class.

Your solutions must use the same symbols as are used on the formulae sheet.

Formulas not on the Formulae Sheet must be derived.

Keep extra decimal places throughout your calculations, and then round-off your final answer to three significant figures.

Submit your answer to each question in WebAssign.


When you have finished the entire exam, scan your written work for questions 8 through 10 and submit a single multi-page PDF file using the link in the Canvas site for your section.

Your WebAssign submission is due no later than 90 minutes after the questions become available and your Canvas submission is due no later than 120 minutes after the questions become available. LATE SUBMISSIONS WILL NOT BE ACCEPTED.

1. 0/0 points

UofS-P115-P117-Honour [4820285]

On my honour, I pledge that I will not give or receive aid during this assessment. I understand that I am expected to complete this assessment with no communication with other persons and no resource material other than the PHYS 115/117 Formulae sheet. I recognize that it is my responsibility to uphold academic integrity and I agree to follow the rules of this assessment and the guidelines laid forth in the policies of the University of Saskatchewan. Furthermore, I fully understand that disciplinary action may be taken against me if I am discovered to have communicated with another person or to have used an internet resource.

 Yes, I understand and agree.



2. 0/1 points

P117-2021-CR-Pressure [4942954]

On a planet where the atmospheric pressure is twice as much as on the Earth and the acceleration due to gravity is four times as much as on the Earth, what will be the height of the column in a mercury barometer, if the height of the column in a mercury barometer on Earth is 760 mm?

- 1520 mm
- 380 mm
- 760 mm
- 95 mm
- 3040 mm



3. 0/1 points

P117-2021-CR-Q3 [4942969]

For an object moving downwards in a viscous medium, which one of the following statements is true regarding the buoyant force, F_B , the resistive frictional (drag) force, F_r , and the gravitational force, F_g , acting on the object?

- F_B UP, F_r DOWN, and these two forces add to zero
- F_B UP, F_r UP, F_g DOWN
- F_B UP, F_r DOWN, F_g DOWN
- F_B UP, F_g DOWN, and these two forces add to zero
- F_r UP, F_g DOWN, and these two forces add to zero



4. 0/1 points

P117-2021-CR-Q10 [4946233]

Which one of the following statements dealing with the deformation of solids is **TRUE**?

- If a metal rod is stressed within its elastic limit, doubling the tensile stress results in the rod stretching an amount that is four times the stretch due to the original stress.
- The elastic moduli (Young's, Shear, and Bulk) all have the dimension of pressure.
- If a metal rod is stressed within its elastic limit, increasing the tensile stress has no effect on the strain.
- Shear modulus is a measure of the change in the surface area of an object under stress.



5. 0/1 points

P117-2021-QD5-BZ [4942987]

A block on a horizontal frictionless surface is connected to an ideal spring (spring constant k) and moves with simple harmonic motion of amplitude A . The velocity and acceleration of the block are v and a , respectively. Which one of the following expressions is correct?

- At the equilibrium position, $v = 0$ and $a = 0$
- At the equilibrium position, $v = \sqrt{\frac{kA^2}{m}}$ and $a = 0$
- At the equilibrium position, $v = \sqrt{\frac{kA}{m}}$ and $a = \frac{kA^2}{m}$
- At maximum displacement from equilibrium, $v = 0$ and $a = \frac{kA^2}{m}$
- At maximum displacement from equilibrium, $v = 0$ and $a = \frac{mA}{k}$



6. 0/1 points

P117-2021-QD7-BZ [4942989]

A person is standing at rest on the platform at a train station. Train 1 is stopped at the station and Train 2 is moving away from the station at a constant speed of 25.0 km/h. Each train blows its whistle at the identical frequency of 188 Hz, but the person hears beats with a frequency of 12.00 Hz. What is the frequency that the person detects for Train 2's whistle?

- 194 Hz
- 176 Hz
- 188 Hz
- 182 Hz
- 200 Hz



7. 0/1 points

P117-2021-QD8-BZ [4942990]

A listener hears the sound from a very small spherical speaker. The power of the sound being emitted from the speaker is then increased and the listener starts walking away from the speaker. When the listener is 10 times further from the speaker than their initial distance, the power emitted by the speaker is 100 times greater than the initial power. What is the resulting change in sound intensity level between the initial and final locations of the listener?

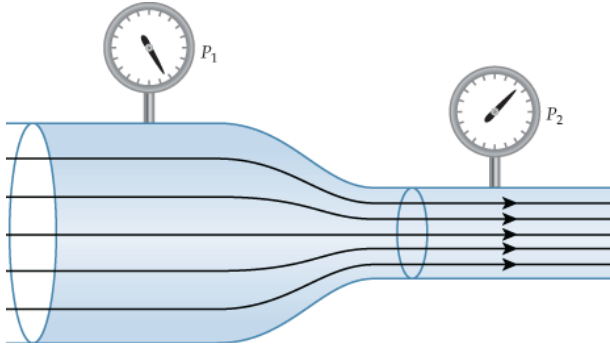
- The sound intensity level has gone up by 5 dB.
- There is no change in the sound intensity level.
- The sound intensity level has gone up by 10 dB.
- The sound intensity level has gone down by 10 dB.
- The sound intensity level has gone down by 5 dB.



8. 0/1 points

P117-2021-QD3-BZ [4942984]

The flow of gasoline through a hose can be monitored using a Venturi tube similar to the one shown in the figure. The density of gasoline is $\rho = 7.00 \times 10^2 \text{ kg/m}^3$, the inlet radius of the Venturi tube (cross-section 1) is 2.30 cm , the outlet radius (cross-section 2) is 1.30 cm , and the difference in pressure measured by the two gauges is $P_1 - P_2 = 1.30 \text{ kPa}$.



(a) Calculate the speed of the gasoline as it leaves the Venturi tube.

m/s

(b) Calculate the volume flow rate of the gasoline.

m³/s

9. 0/1 points

P117-2021-CR-Q4v2 [4947458]

A block on a horizontal frictionless surface is attached to a horizontal ideal spring and oscillating with a maximum displacement from equilibrium of 0.223 m . The maximum speed of the block is 3.45 m/s . The total mechanical energy of the block-spring system is $E = 44.2 \text{ J}$.

(a) Calculate the spring constant.

N/m

(b) Calculate the speed of the block when its displacement is 0.160 m .

m/s

(c) Suppose the same system is released from rest at $x = 0.223 \text{ m}$ on a rough surface so that it loses 12.4 J by the time the block reaches its first turn-around point (after passing equilibrium at $x = 0$). Calculate the distance of the block from the equilibrium position at that instant.

m

10. 0/1 points

P117-2021-QD9-BZ [4942991]

A simplified version of our voice production system considers the throat and mouth to be a tube closed at one end.

(a) Calculate the fundamental frequency (to the nearest Hz) if the effective length of the tube is 0.236 m and the air temperature is 25.0°C . The speed of sound in air at 0°C is 331 m/s .

Hz

(b) Assuming that the temperature dependence of the speed of sound in helium is the same as for air, determine the fundamental frequency (to the nearest Hz) if the air is replaced by helium. The speed of sound in helium at 0°C is 965 m/s .

Hz

Assignment Details

Name (AID): **PHYS 117 2021 Regular Midterm Exam (18524728)**

Submissions Allowed: 1

Category: **Exam**

Code:

Feedback Settings

Before due date

After due date

Locked: **Yes**

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Last Saved: **Mar 8, 2021 08:47 PM CST**

Group: **P115-Fall-2020**

Randomization: **Person**

Which graded: **Question Part**