
LAST NAME
as on student card

First Name(s)
as on student card

Student Number

Practical Group
Code

PHY131H1F
Term Test 2 —version A
Tuesday, November 17, 2015
Duration: 80 minutes

Aids allowed: A calculator with no communication ability (programmable calculators and graphing calculators are okay). A single hand-written aid-sheet prepared by the student, no larger than 8.5”x11”, written on both sides. A hard-copy English translation dictionary. A ruler.

- **Completely turn off** any communication device you may have and leave it with your belongings at the front of the room.
- **DO NOT separate the sheets of your question paper.** You can, however, *carefully* tear off the blank page at the end, as it does not have to be handed in.
- Before starting, please **PRINT IN BLOCK LETTERS your name, student number, and practical group code** at the top of this page **and** on the answer sheet.

Locate your test version number in the header at the top of the page and fill in the circle with the corresponding version code on your answer sheet in the “Form Code” box. Mark in your student number by shading the circles at the top-right of the sheet, starting with a 0 if the first digit is a 9. It is not required to bubble in your surname on the lower half of the sheet.

Scanned Area of the Answer Sheet:

1. **Use a dark-black, soft-lead pencil or a black pen.**
2. Indicate your answer to a multiple-choice question by thoroughly filling the appropriate circle on the answer sheet and also by recording your answer on the test paper.
3. If you wish to modify an answer, erase your pencil mark thoroughly.
4. **Do not write anything else on the answer sheet.** Use the blank sheets at the end or the back of the question sheets for rough work.

The first part of the test consists of **10** multiple-choice questions, worth 2 points each, or altogether 20 points. Each multiple-choice question has one best answer, and up to four answers that are not the best. You receive 2 points for choosing the best answer and nothing else. You receive 0 points if you either choose a non-best answer, multiple answers, or no answer at all.

The second part of the test is a set of free-form questions, worth a total of 12 points. To be awarded maximum credit, you must provide fully worked solutions to all parts of the free-form questions. In addition to showing your work, please put your answer(s) for each part in the boxes provided. You can use the back-side of the sheets and the blank pages at the end for your rough work which will not be graded or taken into account.

The total number of points available for the test is 32.

Possibly helpful information for this test:

$\pi = 3.14159$ is the ratio of the circumference to the diameter of a circle

$g = 9.80 \text{ m/s}^2$ is the acceleration due to gravity near the Earth's surface.

$G = 6.67 \times 10^{-11} \text{ N m}^2/\text{kg}^2$ is the universal gravitational constant.

Common Prefixes:

k = "kilo-" = 10^3

c = "centi-" = 10^{-2}

m = "milli-" = 10^{-3}

μ = "micro-" = 10^{-6}

n = "nano-" = 10^{-9}

60 seconds = 1 minute; 60 minutes = 1 hour; 24 hours = 1 day; 365.25 days = 1 year

The quadratic equation: If $ax^2 + bx + c = 0$, then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

If the base of an equilateral triangle is a , then its height is $\frac{\sqrt{3}}{2} a$.

Air resistance may be neglected in all questions, unless otherwise stated.

