



The 41st International Physics Olympiad
Croatia
Experimental Competition
Wednesday, July 21st, 2010

Please read this first:

1. The time given is 5 hours.
2. There are two experimental problems. Each experiment is awarded 10 points.
3. Use only the provided setup, pencil, and sheets.
4. Write your solutions in the **Answer sheets**. **Working sheets** can be used if necessary. *All will be considered for marks.*
5. When using working sheets:
 - Use only the front side of the paper. Start each part on a fresh sheet of paper.
 - On every paper, write:
 - 1) the **Task No.** for the task attempted
 - 2) the **Page No.** - the progressive number of each sheet for that part
 - 3) the **Total No. of Pages** used for that part
 - 4) your **Country Code** and your **Student Code**
 - Write concisely – Limit the use of text to minimum. Use equations, numbers, symbols, figures and graphs as far as possible.
 - Cross out pages that you do not wish to be marked. Do not include them in your numbering.
6. For each task, use the **Answer Sheet** to fill in your *final answer* in the appropriate box. Give the appropriate number of significant figures. Remember to state the units.
7. When you have finished, arrange all sheets in this order *for each part*:
 - the **Answer Sheet**
 - writing sheets that you wish to be marked
 - writing sheets that you do not wish to be markedPlace all unused sheets, graph papers and the question paper at the bottom.
8. Clip *all sheets* together and leave them on your desk.
9. You are not allowed to take *any* sheet of paper or *any* material used in the experiment out of the examination hall.



Separate instructions for using the scale



The scale is turned **ON-OFF** by the **right button**.

The **middle button** (Z/T) sets the digits to zero, that is, this is the **TARA** function.

The **left button** can be used to change **units**.

Instruction: Put units to grams in case it is in other units!

Separate instructions for using the press

The press is used in both problems. The upper part of the press is turned up-side down in the second experiment as compared to the first. **Its position is illustrated in the tasks themselves.** The stone is to be placed on the upper part of the press. Its weight helps the upper part of the press to slide down when you turn the wing-nut (if you find necessary, you can gently press the upper part by your hand (close to the vertical bar) while you turn the wing nut to ensure smooth sliding of the press). **For performing measurements, you should use the fact that the upper part of the press moves 2 mm when the wing nut is rotated 360 degrees.**



SAFETY WARNING

You should be careful when playing with the wooden stick, the rod magnet and the hollow cylinder.

Be careful not to stick the wooden stick in your eyes!!!

Do not look with your eyes into the hollow cylinder when playing with the rod magnet inside the cylinder. It can be ejected from the cylinder and injure your eyes.