

Universität Leipzig, Fakultät für Physik und Geowissenschaften

Exercises for Experimental Physics 3 – IPSP

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Exercise Sheet 13 (WS 2010/11)

Date of Issue to Students: Jan. 27th 2010

Date of Submission: Feb. 3rd 2011

Submission Place: Marked mailbox next to room 302 (Linnestr. 5)

Submission Time: 11:00 a.m. at the submission day noted above

Please note: Write your name and matriculation number on EACH sheet of paper.

EXAM: Tuesday, Feb. 8th at 9:00 am, ThHS

Exercises:

1. The spectrum of neon is exceptionally rich in the visible region. Among the many lines are two lines at wavelengths of 519.313 nm and 519.322 nm. If light from a neon discharge tube is normally incident on a transmission grating with 8400 lines per centimeter and the spectrum is observed in second order, what must be the width of the grating that is illuminated, so that these two lines can be resolved? (5 Points)
2. The near point of a certain person's eyes is 80 cm. Reading glasses are prescribed so that he can read a book at 25 cm from his eye. The glasses are 2.0 cm from the eye. What diopter lenses should be used in the glasses? (4 Points)
3. A crude, symmetric handheld microscope consists of two 20-D lenses fastened at the ends of a tube 30 cm long. (a) What is the tube length of this microscope? (b) What is the lateral magnification of the objective? (c) What is the magnifying power of the microscope? (d) How far from the objective should the object be placed? (6 Points)