PROCESSO SELETIVO – TURMA DE 2011
FASE 1 – PROVA DE INGLÊS

NOME: _____

ASSINATURA: _____

Na página anexa, você encontrará um pequeno artigo de H. Kruglag publicado na revista The Physics Teacher em 1993 (vol. 31, p. 104). Após a leitura deste texto, responda <u>em português</u> às perguntas apresentadas, com base no que consta no texto. É permitida a consulta a dicionários.

Questão 1

Qual é o título do artigo?

Questão 2

Qual é o papel desempenhado pelo CD na demonstração proposta?

Questão 3

Quais as instruções fornecidas pelo autor para a montagem da experiência?

Questão 4

A que distância da tela deve ser colocado o laser?

Questão 5

Qual é o valor do comprimento de onda utilizado pelo autor para comparar com os comprimentos de onda do laser determinados experimentalmente? E qual a origem deste dado?

Questão 6

Quais são as condições de iluminação para que o espectro possa ser observado numa sala de aula grande?

Questão 7

Qual a sugestão do autor para a realização desta experiência num laboratório?

Diffraction Demonstration with a Compact Disc

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Here is another way to demonstrate an important physics concept with a readily available object—the compact disc (CD). This time the CD is used as a *reflection* diffraction grating. The sound information code on a CD is pressed as pits into a polycarbonate substrate of the disc and covered with a thin aluminum coating.[1] The standard distance between two adjacent loops of the coded track is 1.6 × 10^{-6} m. This makes the disc suitable as a diffraction grating, useful in classroom and laboratory.

Cover the CD with a black paper mask leaving a 1- × 4-cm rectangular window and support the disc so that its plane is vertical and the window horizontal (refer to Fig. 1).

In semidarkness, direct a laser beam at the center of the CD window. The reflected pattern may be projected on a screen placed behind the light source. (The disc may have to be tilted slightly to clear the laser.)

With the laser 1 m from the screen, the distance between the two first-order images is 0.88 m and between the second 2.73 m. These values correspond to laser wavelengths of 644 and 645 nm,
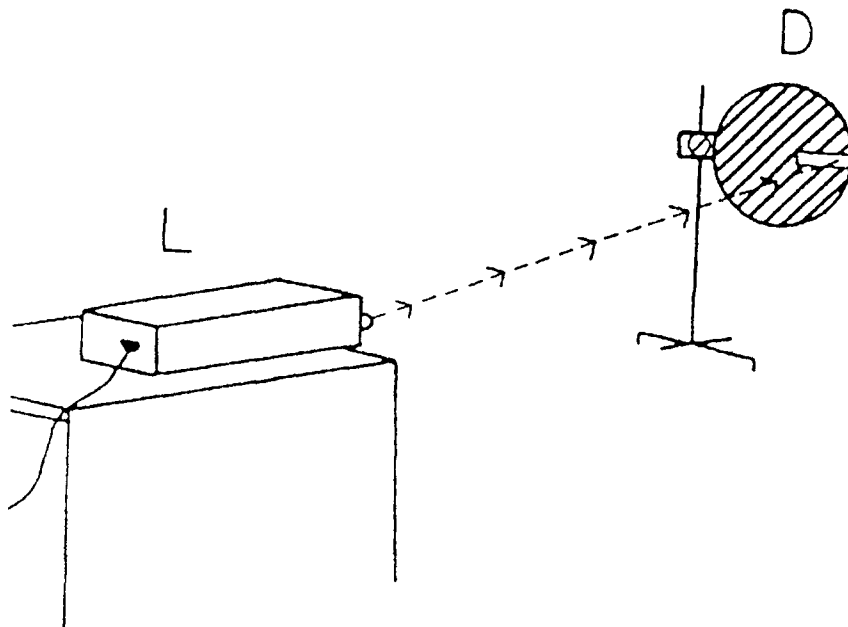

Fig. 1. Experimental arrangement for diffraction with a laser. L, laser; D, compact disc.

in good agreement with 632 nm listed in the manufacturer's manual.

In subdued light, the diffraction spectrum of a laser beam is visible in a large lecture room. Students can quickly calculate from distance measurements either the laser wavelength or the spacing between the code loops of the CD.

In the laboratory, the CD may be used with a mercury source. In this case its spectrum should be projected through a converging lens onto the scale of a spectrometer.

Reference
1. K.C. Pohlmann, *The Compact Disk: A Handbook of Theory and Use* (A-R Editions, Madison, WI, 1989).

Free-Body Diagrams

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Editor's Note: *On the following pages we reproduce free-body exercises furnished us by James Court of City College of San Francisco. Readers are invited to photocopy and use any or all of the exercises. Graphics were prepared using DrawPerfect 1.1. They can be modified with WordPerfect 5.1 or WordPerfect for Windows and printed on a graphics printer. The author will be happy to supply the file to anyone who asks.*

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