EASTERN UNIVERSITY, SRI LANKA

SECOND EXAMINATION IN SCIENCES - 2003/2004

SECOND SEMESTER

(JUNE/JULY 2005)

PH 202 PHYSICAL OPTICS II

Time: 01 hour.

Answer <u>ALL</u> Questions

1. Describe Fraunfofer diffraction produced by a double slit. Hence, obtain the conditions for minimas and maximas in the intensity distributions if $d = 3b$, where d is the slit width and is the slit separation. Plot the graph of intensity distribution.

   Two parallel slits have widths $0.15mm$ and seperation $0.45mm$. They have illuminated normally by light of $\lambda = 6000.A^0$ and a convergence lens of $100cm$ focal length focuses the emergent light. Deduce the positions of the first four-interference mexima on one side in the focal plane of the lens.

2. (i) What is meant by resolving power?

   (ii) State the Rayleigh's criterion of Resolution.

   (iii) Discuss the concepts of resolved images, just resolved images and not resolved images.

   Derive the expression for the resolving power of a telescope.

   The mean wavelength effective in visual observation may be treated as $5890A^0$. What is the smallest angular separation between two point stars which a telescope of $20cm$ diameter objective can resolve?