Major Examination

M. Tech. (Instrument Technology)

IDL-731 (Basic Optical Components and Instruments)

Max. Marks = 50 **Date: 28-11-2006**

Time: 3.30 P.M. – 5. 30 P.M.

Answer all questions

1. Explain in brief with ray diagram
   (a) difference between spherical aberration and coma. 4
   (b) astigmatism. 2
   (c) difference between Huygens and Remsden eyepiece. 3
   (d) derive formula for minimum deviation in isosceles prism. 4

2. Explain in brief
   (a) resolving power of diffraction grating. 2
   (b) free spectral range. 2
   (c) blaze angle. 2

3. Explain with proper ray diagrams
   (a) difference between linear and circular birefringence. 4
   (b) Explain how Babinet compensator can be approximated to work as $\lambda/2$ wave plate? 3

4. (a) Explain the working of a grating spectrometer based Czerney-Turner mounting. Give it's ray diagram. 4
   (b) Give the difference between monochromator and spectrometer. 2

5. Telescopes
   (a) give ray diagram and working of reflecting telescope based on Coude focus. 4
   (b) Explain the following
      (i) light gathering power. 1
      (ii) magnifying power. 1

6. Miscroscopes
   (a) give ray diagram and working of compound microscope. 4
   (b) derive formula for total magnification in compound microscope. 2

7. Explain how optical interferometry works for different measurements. Give how length is measured by Michelson Interferomneter or Twymann Green Interferometer. 6