



The Royal Australian and New Zealand College of Ophthalmologists

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OPHTHALMIC BASIC SCIENCE EXAMINATIONS OPTICS 14 October 2008

Duration of paper:	3 hours	Total Marks: 180
Total No. of questions:	18 (10 marks each)	

- ◆ **Candidates must attempt all questions**
 - ◆ **Write your answers in the answer pad using CLEAR and LEGIBLE writing, use diagrams and point form where appropriate**
 - ◆ **Start a new page for each question; do not write on the reverse of any answer page. Make sure to put your candidate number on each page**
 - ◆ **If you cross out an area of your own writing, it will not be considered by the examiners**
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Question 1

The Maddox rod is used to test extraocular muscle balance.
Describe the optics of the Maddox rod and how is it used.

Question 2

How can contact lenses be used to correct astigmatism?

Question 3

Describe the advantages and disadvantages of indirect ophthalmoscopy.

Question 4

With drawings, describe the image formed by the following astigmatic lens for an point object at infinity (+2.00 DS/+1.00 DC axis 90)

Question 5

Describe the tissue interaction with a Neodymium-YAG laser and its application in clinical ophthalmology.

Question 6

The Argon laser is used a lot in clinical ophthalmology.
Describe the optical principles of the production of this laser and its characteristics.

Question 7

You suspect a patient has a narrow anterior chamber angle. How do you confirm this and explain the optical principles involved?

Question 8

What is the endpoint of retinoscopy and how is it arrived at? Describe the optical principles involved including diagrams.

Question 9

Describe the dioptric power of spherical lenses and their vergence power. Include the principles of vergence of light rays.

Question 10

Describe ocular aberrations and the way they are minimised in the human eye.

Question 11

Define the terms far point, near point and amplitude of accommodation.
Describe the effect of ageing on the amplitude of accommodation.

Question 12

Describe the phenomenon of light interference and its relevance to ophthalmology.

Question 13

A highly hypermetropic eye undergoes cataract surgery. The postoperative spectacle refraction is plus 4.0 D. Describe how this may have occurred.

Question 14

A skier at high altitude may require sunglasses with 10% transmittance. Describe the phenomena of transmission, absorption and optical density.

Question 15

What is ultrasound and how is it created?
Briefly describe its applications in ophthalmology.

Question 16

Therapeutic prisms are sometimes indicated to relieve permanent diplopia. Describe the method of spherical lens decentration and its limitations.

Question 17

Describe the phenomenon of total internal reflection and its use in ophthalmology.

Question 18

Briefly describe the optical principles of the Focimeter.

END OF PAPER