



The Royal Australian and New Zealand College of Ophthalmologists

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OPHTHALMIC BASIC SCIENCE EXAMINATIONS PHYSIOLOGY 04 November 2008

Duration of paper: 3 hours **Total Marks:** 150
Total No. of questions: 15

- ◆ 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 (20 Marks)

Describe the physiological basis of dark adaptation. Include a detailed diagram of the psychophysical dark adaptation function.

Question 2 (20 Marks)

Describe the actions of the human extraocular muscles. Include in your answer an account of how different models of extraocular muscle actions have been used to aid our understanding of this topic.

Question 3 (20 Marks)

Give an account of the current understanding of accommodation (excluding presbyopia) and the ways in which it can be measured.

Question 4 (10 Marks)

Describe the local response to traumatic corneal epithelial loss.

Question 5 (10 Marks)

Routine clinical evaluation of glaucoma patients involves the assessment of visual field function. Explain the psycho-physical basis for perimetry.

Question 6 (10 Marks)

Explain the physiology of aqueous outflow.

Question 7 (10 Marks)

Describe the types of muscle fibres that are found in human extraocular rectus muscles.

Question 8 (10 Marks)

A patient is shown to have a relative afferent pupil defect. Explain the physiologic basis of the testing of pupil responses in this scenario.

Question 9 (10 Marks)

The electroretinogram (ERG) is very useful in the diagnosis of retinal disorders.

- a. Draw and label a normal scotopic maximal full field combined response
- b. Explain the origin of each of its components
- c. Briefly explain the principles of the recording technique of a full field ERG

Question 10 (5 Marks)

List three commonly experienced entoptic phenomena and explain their physiological basis.

Question 11 (5 Marks)

Draw a table that lists the differences between magnocellular (M) and parvocellular (P) cell sensitivities to different visual stimuli features.

Question 12 (5 Marks)

Explain the receptive field characteristics of ganglion cells.

Question 13 (5 Marks)

Briefly describe the neural control of the production of the tear film.

Question 14 (5 Marks)

Briefly describe the effects of eyelid movement on lacrimal drainage.

Question 15 (5 Marks)

Briefly describe the functions of the vitreous.

END OF PAPER