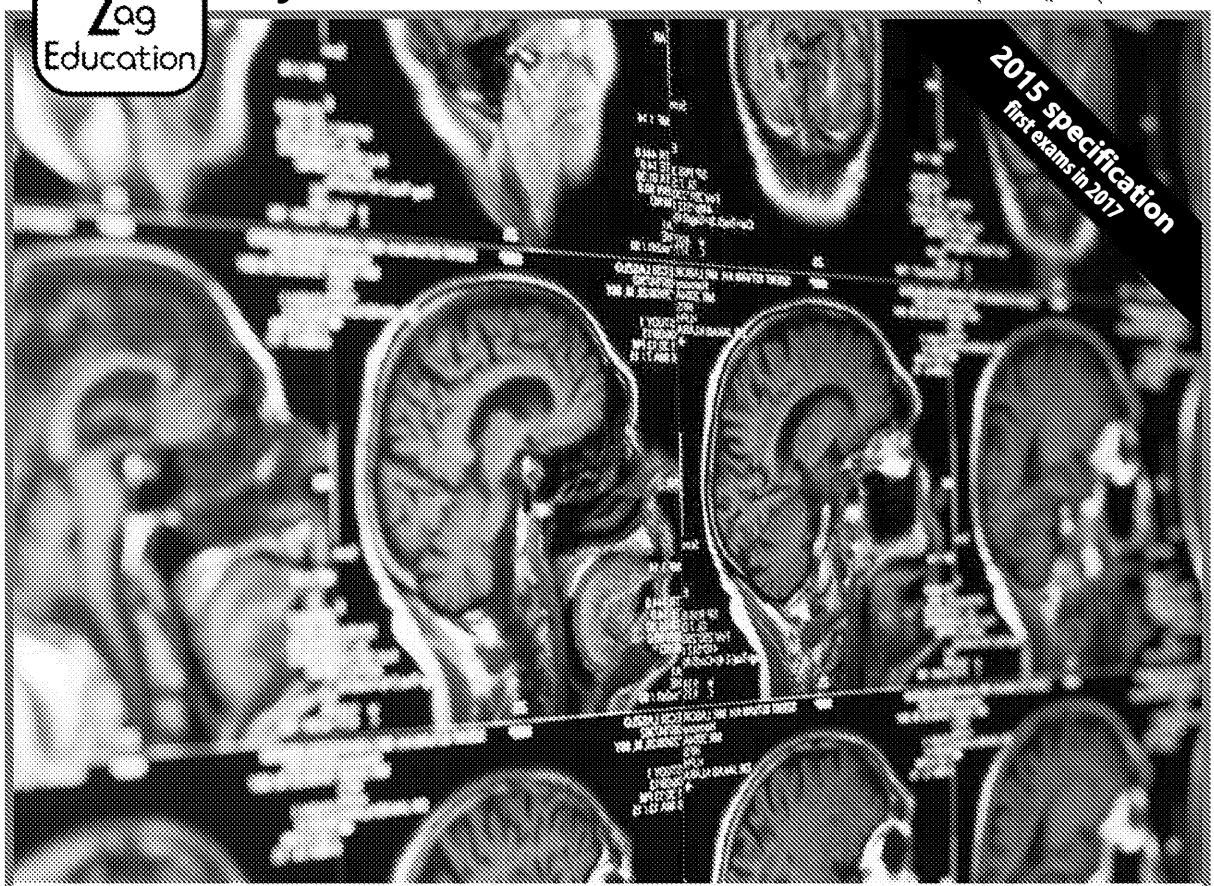
Zig Zag Education

Physics

A Level | AQA | 7408



Topic Tests for A Level AQA Physics

Option 10: Medical Physics

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POD 6347

Contents

Teacher's Introduction

These topic tests have been designed to help you and your students assess their knowledge of a topic after you have taught each part of **A Level AQA Physics Option 10: Medical Physics** (specification for first teaching from September 2015).

Each topic test closely follows the content of the specification and includes:

- **Factual questions**: Some simpler factual questions are included to ensure that all the content and basics are covered, and to allow weaker learners access to some marks.
- **Short-answer questions**: These are not in exam style, and the purpose of these is to test different elements, knowledge and skills from the specification in a variety of styles.
- **Exam-style questions**: Where appropriate, topics may contain one or more exam-style questions, to prepare students for what they might meet in the exam, and to test exam skills.

Mathematical and practical skills are also covered in these topic tests.

Tests have been designed to take approximately 25–40 minutes and are worth on average between 25 and 35 marks. Please note that some tests have been split, as shown in the table:

Topic Number	Number of Marks
3.10.1	29
3.10.2	28
3.10.3	25
3.10.4	34
3.10.5 (1–2)	36
3.10.5 (3–4)	27
3.10.6	37

The topic tests are suitable for a classroom assessment, revision aid or homework task and are, therefore, suitable for use immediately after a topic is completed in class or at the end of teaching the course.

Students are able to see the number of marks awarded for each question, allowing them to gauge the level of detail they will require for the answers, as in exam conditions. Full answers with marks are included at the end of the resource. Additionally, it makes the resource a suitable tool for students to use independently.

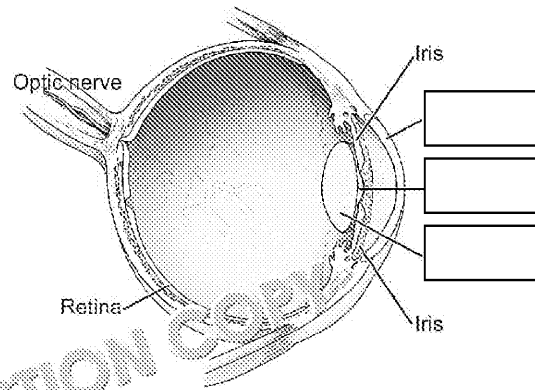
It is recommended that students have access to a calculator to complete the questions.

Students may also need a sheet containing Physics data and formulae, which can be found on the exam board website.

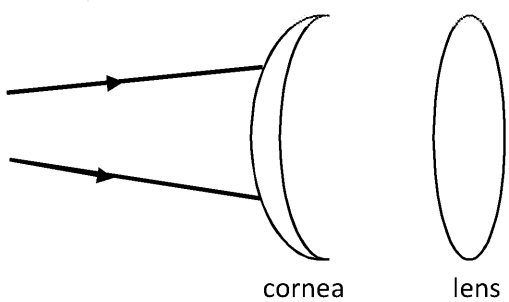
I hope you find these tests useful during your teaching.

3.10.1 Physics of the Eye

1. a) Complete the labels on this diagram of the eye.



b) Complete the diagram to show how an image is formed.



2. a) Which type of light-detecting cell can distinguish colours?

.....

b) Which type of light-detecting cell can distinguish low light levels?

.....

c) Why do you have to 'look off' to one side of what you want to see in th

.....

3. a) What is myopia?

.....

b) What causes hypermetropia?

.....

c) What causes astigmatism?

.....

4. a) A lens has a power of 17 D. What is its focal length?

.....

.....

.....

b) It is used to look at an object 0.50 m away. How far behind the lens is t

.....

.....

.....

.....

c) W th ification in this instance?

.....

.....

5. a) What type of lens is used to correct astigmatism?

.....

.....

b) Draw a ray diagram to explain what kind of lens is needed to correct sh

c) A t nearpoint of 0.25 m to focus light on her retina. Her
1. her eye is measured to be 0.022 m from lens to retina. What
co this?

.....

.....

.....

.....

6. Sketch a graph of the spectral response of the human eye.

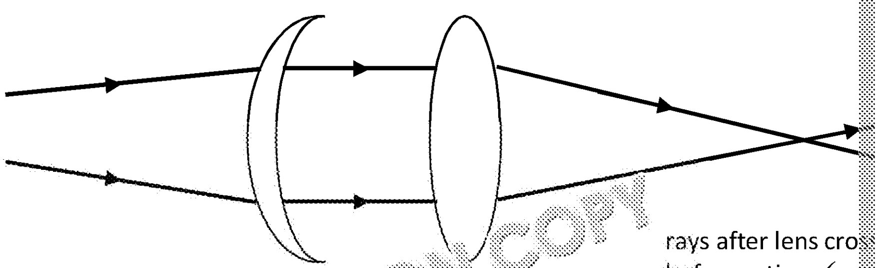
Preview of Questions Ends Here

Answers

3.10.1 Physics of the Eye

1. a) top to bottom:
   cornea ✓ pupil ✓ lens ✓

   b)



rays after lens cross before retina ✓

rays between cornea [illegible] lens less diverging [illegible]ore, or even [illegible]g, but less converging than after lens ✓

2. a) cones

   b) rods

   c) no rods in central bit of retina / fovea

   d) persistence of vision

3. a) short-sightedness

   b) eyeball too short / lens not powerful enough

   c) deformed cornea

4. a) $\frac{1}{17}$ ✓ = 0.059 ✓ m ✓

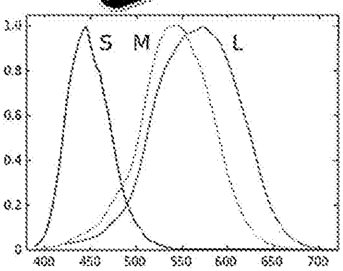
   b) $\frac{1}{0.50} - 17 = \frac{1}{v}$ ✓
   $v = \frac{1}{15}$ ✓ = 0.067 ✓ m

   c) $\frac{\text{answer to b}}{0.50}$ ✓ = 0.13 ✓

5. a) toric OR cylindrical

   b) shows that without correction rays cross to[illegible] front of retina ✓
   shows that a concave lens is needed [illegible] make the rays diverge before eye ✓

   c) current power = $\frac{1}{[illegible]}$ [illegible] ✓ [illegible]46 ✓ D
   required power = [illegible] $\frac{1}{0.25} + \frac{1}{0.022}$ = 49 ✓ D
   co[illegible] = 49 – 46 = +3.0 ✓ D



6.

shape ✓
peaks in right places ✓

OR one large bell curve ✓
centred at 550 nm ✓

Preview of Answers Ends Here