Level 6 Certificate in Contact Lens Practice

Unit 2 – Visual Optics

Principal Examiner:
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Winter 2024
Duration: 2 hours

Candidate Number: ☐☐☐☐☐☐ **Date:** ☐☐/☐☐/☐☐ **Seating Location:** ☐☐☐

Answer **four** questions only. Please tick below the numbers of the questions attempted:				
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

☐ Number of Supplementary Sheets used (if any), including graph paper.

For office use only

Question number	1	2	3	4	5	Total	
						Overall	%
Marks							
Moderated							
Borderline (57%-62%)	Please tick the box to acknowledge that this is a borderline result and confirm that the marks have been checked in terms of allocation and addition.					☐	

Examiner's Signature		Moderator's Signature	

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Question 1

A trial RGP contact lens has the following parameters;

FOZR	7.95mm
BVP	-3.00DS
Centre thickness	0.15mm
Refractive index	1.46

This lens shows a clearance of 0.15mm and is worn in an eye with keratometry readings of 7.50mm along130/ 7.85mm along 40. The refractive index of the tears is 1.336.

A thin lens over-refraction of -2.50DS/- 0.75DC x 130 worn 15mm in front of the contact lens front surface is the appropriate prescription required for the patient to obtain clear distance vision.

Calculate:

a) The back surface radius (BOZR) of the trial contact lens **(20 marks)**

b) The ocular refraction of the patient, expressed in sphere-cyl form **(80 marks)**

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Question 2

Write short notes on any **THREE** of the following:

a) Spectacle magnification in thick contact lens systems

b) Types, advantages & disadvantages of alternating vision bifocal contact lenses

c) Construction, use and advantages of the Badal optometer

d) Effects of the tear lens when a contact lens is placed on spherical and astigmatic corneas

You should include 9 facts for each topic, which may include diagrams. **(100 marks)**

Question 3

An RGP contact lens has been manufactured to the following specification;

C2 8.10:7.00/10.50:9.20 +4.25DS
centre thickness 0.35mm
refractive index 1.47

Calculate:

a) The front surface radius of the contact lens. **(15 marks)**

b) The **radial edge thickness** measured 0.10mm in from the edge and measured on the front surface. **(85 marks)**

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a) **Calculate** the front surface radius of the contact lens. **(15 marks)**

b) **Calculate** the **radial edge thickness** measured 0.10mm in from the edge and measured on the front surface. **(85 marks)**

Question 4

a) **Give a detailed description** of how the prescription -3.50DS/-2.50DC x 90 is obtained by fan and block, using the best vision sphere method of subjective refraction. Do not include details of how the best vision sphere is determined.

Include diagrams✎ to show the position of the focal lines at each stage. **(75 marks)**

b) **Describe** how the final cylinder power and axis would be **verified** using the crossed cylinder method. **(25 marks)**

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b) **Describe** how the final cylinder power and axis would be **verified** using the crossed cylinder method. **(25 marks)**

Question 5

A toroidal cornea has anterior radii of 8.00mm along 105 and 8.55mm along 15. The posterior radii are 7.80mm along 105 and 8.40mm along 15.

a) **Find** the total corneal astigmatism if the corneal thickness is 0.48mm and the refractive indices of the cornea and aqueous are 1.376 and 1.336 respectively.

A value and axis must be specified. **(35 marks)**

b) **State** the approximate link between the amount of front and back surface corneal astigmatism. **(10 marks)**

c) **Calculate** the corneal astigmatism of the same eye measured by a keratometer calibrated for 1.3375.

A value and axis must be specified. **(15 marks)**

d) **Comment** on the reasons for the use of 1.3375 as the keratometer refractive index. **(10 marks)**

e) **Discuss** the construction and uses of the Placido disc. **(30 marks)**

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A value and axis must be specified. **(15 marks)**

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e) **Discuss** the construction and uses of the Placido disc. **(30 marks)**

End of questions for this paper

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DO NOT TURN THIS PAPER OVER UNTIL ADVISED TO DO SO BY THE INVIGILATOR

Important Instructions to Candidates

Please read carefully and follow these instructions when told to do so by the Examiner/Invigilator.

1. You will be given 5 minutes at the beginning of the examination to read through the questions.
2. **Please enter your candidate number and date in the boxes on the front cover of this booklet.**
3. Please **DO NOT write your name** on the booklet. Candidates must remain anonymous for marking purposes.
4. Candidates must answer questions legibly, using blue/black ink or ball-point pen. *Pencil may be used for graphs and diagrams only.*
5. Candidates please note, the examination paper has been designed for you to answer the stated number of questions within the allotted time.
6. Candidates must read each question carefully and make sure that you know what you have to do before starting your answer.
7. Candidates must write the answer to each question in the space provided. Additional paper may be used if necessary but you must show your Candidate Number and question number(s) clearly at the top of each page.
8. Please do not write in the margins.
9. Any extra pages used should be securely fastened together using a treasury tag. This includes any diagrams, additional graph paper or any continuation paper.
10. Candidates are advised to carefully cross out any work not intended to be marked by the Examiner.
11. Please do not tear out any part of this booklet. All work must be handed in.

Important Information for Candidates

1. Answer **four** questions only.
2. Answer all parts for each question.
3. Candidates MUST work to at least 4 decimal places in ALL calculation questions and they will be penalised if this is not done.
4. Where relevant, the marks awarded for each part of a question are given in brackets, e.g. **(10 marks)**.
5. ✎ 🖩 These symbols indicate that a diagram/calculation is required or a diagram needs annotating.
6. This entire document consists of 20 pages. Any blank pages are indicated.

When told to do so by the Invigilator, you may turn the paper over and begin.