Level 6 Certificate in Contact Lens Practice

Unit 2 – Visual Optics

Principal Examiner:
J Underwood MSc BSc (Hons) FBDO (Hons) CL (Hons) SLD SMC(Tech) FEAOO CertEd

Summer 2023
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

Write short notes on any **THREE** of the following: **(100 marks)**

i) Purpose and types of keratometer doubling devices.

ii) The causes and correction of irregular astigmatism.

iii) Types, advantages & disadvantages of simultaneous vision (bi-vision) bifocal contact lenses.

iv) Construction and uses of the duochrome.

You should include 9 facts for each topic.

Question 2

i) A patient is corrected for distance vision with spectacles of prescription R & L +2.00DS, worn at a vertex distance of 15mm. The inter-pupillary distance is 64mm.

An object is viewed on the midline between the two eyes and is 30cm in front of the spectacle plane. The distance from the spectacle plane to the centre of rotation of the eye is 28mm.

Calculate the convergence in prism dioptres and the ocular accommodation when the patient is wearing;

a) Spectacles **(50 marks)**

b) Contact lenses **(25 marks)**

ii) **Comment** on the link between accommodation and convergence in spectacle and contact lens wear considering both hyperopic and myopic patients. **(25 marks)**

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Question 3

A trial RGP contact lens has the following parameters;

FOZR	7.55mm
BVP	+3.25DS
Centre thickness	0.21mm
Refractive index	1.46

This lens shows a clearance of 0.15mm and is worn in an eye with keratometry readings of 7.90mm along 80/ 8.15mm along170. The refractive index of the tears is 1.336.

A thin lens over-refraction of +1.50DS/-1.00DC x 170 worn 12mm in front of the contact lens front surface is the appropriate prescription required for the patient to obtain clear distance vision.

Calculate:

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

ii) The ocular refraction of the eye, expressed in sphere-cyl form. **(80 marks)**

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Question 4

A soft contact lens has been manufactured to the following specification;

C1 8.90:14.20 -1.75DS
centre thickness 0.10mm
refractive index 1.43

Calculate;

i) The **axial edge thickness** measured 0.30mm in from the edge and measured on the front surface. **(50 marks)**

ii) The **radial edge thickness** of the lens measured at the same point. **(50 marks)**

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ii) The **radial edge thickness** of the lens measured at the same point. **(50 marks)**

Question 5

i) **Give a detailed description** of how the prescription -4.50DS/-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)**

ii) **Describe** how the final cylinder power and axis is **verified** using the crossed cylinder method. **(25 marks)**

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ii) **Describe** how the final cylinder power and axis is **verified** using the crossed cylinder method. **(25 marks)**

End of questions for this paper

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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 24 pages. Any blank pages are indicated.

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