QCA Level 6

Diploma in Ophthalmic Dispensing

Conditions of Admission Syllabus

Theoretical and Practical Assessment Requirements

Association of British Dispensing Opticians

Preliminary and Final Qualifying Dispensing Examinations

Held in Summer and Winter each year

Conditions of Admission

A The minimum entry standard is the achievement of grade C or higher in the General Certificate of Secondary Education in the following subjects:

- Mathematics
- English
- a science based subject, and
- two other subjects

The Academic Committee may consider the results obtained in an equivalent examination. However the teaching institutions may require a higher standard for admission to their courses.

The Academic Committee may agree to waive this educational requirement in respect of persons who have had at least ten years practical experience in optics.

The student must, subject to what is stated above, normally have had at the date of their Final Qualifying Practical Examination, a minimum period of twelve months practical experience of optical dispensing with approved employers.

B Students must generally be engaged in or training in the practice of optical dispensing with hospitals or recognised dispensing or ophthalmic opticians (optometrists).

The Academic Committee may agree to the admission of students who are serving with HM Forces whose bona fide intention it is to enter optical dispensing on leaving the Services, or other persons not immediately engaged in but whose intention is shortly to enter optical dispensing.

C The full examination, i.e. theoretical and practical sections, may be taken generally on completion of three years of study, full or part-time at College, or by Distance Learning course.

D It is a requirement of the General Optical Council that those seeking registration must have had at least 1600 previous experience in practice, which the examining body is required to certify.

E To be able to make this certification ABDO lays down a schedule of work and experience, which the trainee must undergo during the Pre-Qualification Period (PQP). The schedule is sent to the trainee and on receipt, the registered optician acting as Supervisor must complete an undertaking that the work and experience detailed will be given. On conclusion of the period the Supervisor then declares that the work schedule required has been observed.

F Part-time students must have had a minimum period of three years' practical experience of optical dispensing with approved employers before the practical section may be taken.

G Full-time students must have completed three years of combined study and practical experience before they sit the Advanced Ophthalmic Dispensing Practice (Unit 11).

Note: The PQP may commence from the start of the Ophthalmic Dispensing course, subject to receipt of Supervisor Declaration. A Diploma **will not** be issued until the concluding declaration signed by the Supervisor has been received. It is therefore important, and in the student's interest, that ABDO is notified of the name and address of their employer immediately a post is obtained.

H Part-time students will be subject to the same requirements prior to examination for satisfaction mentioned at B and C above.

I The student acknowledges and accepts the conditions governing issue of Diplomas, further details of which can be obtained from ABDO.

Exemptions

Any exemptions from ABDO's examinations shall be at the discretion of the Director of Professional Examinations in each individual case.

There is **no** exemption from the Ophthalmic Dispensing Practice (Unit 3) and the Advanced Ophthalmic Dispensing Practice (Unit 11) examinations. Any exemptions from a Theoretical examination would only be considered on an individual basis, on receipt of a written application.

Re-Admission to Examinations

Preliminary and Final Practical/Theoretical Examinations

Students who fail one or more units three times will not be admitted for re-examination until they have furnished proof that a further period of sustained study has been undertaken as approved by the Examination Boards. One further attempt will then be allowed.

The maximum number of attempts at a unit of the syllabus taken as a whole, or in parts, is FOUR.

Closing Dates

The closing dates for Examination Entry Forms are:

Summer Sittings	UK Overseas	30 March 28 February
Winter Sittings	UK Overseas	15 October 15 October

Boards of Examiners

There are two Examination Boards that contribute to the awarding of the Level 6 Diploma in Ophthalmic Dispensing, in accordance with the published assessment regulations. The Examination Board for Theoretical Examinations is responsible for all theoretical results and the Examination Board for Practical Examinations is responsible for all practical results. Both are constituted under the authority of the Academic Committee of the Association of British Dispensing Opticians.

Syllabus Index

Syllabus Unit Titles and Qualifying Examinations

Asssessment Format

Unit	Title	Format	Time Allowed
1	Theory of General Optics	*A combined theory examination of six written questions to be attempted from a choice of eight*	3 hours
2	Theory of Ophthalmic Lenses		
3	Ophthalmic Dispensing Practice	*A practical/oral examination*	3 hours
4	Theory of Ophthalmic Dispensing	*A combined theory examination of six written questions to be attempted from a choice of eight*	3 hours
5	Advanced Theory in Ophthalmic Lenses		
6	Professional Conduct in Ophthalmic Dispensing	*Short answer questions*	1 hour
7	Communication in Ophthalmic Dispensing	*Short answer questions*	1 hour
8	The Assessment & Management of Refractive Errors	*Four written questions to be attempted from a choice of five*	2 hours
9	Low Vision in Ophthalmic Dispensing	*Four written questions to be attempted from a choice of five*	2 hours
10	The Basic Principles of Contact Lens Wear	*Short answer questions*	1 hour
11	Advanced Ophthalmic Dispensing Practice	*A practical/oral examination*	6 hours

Theory of General Optics

Unit 1

A Propagation of Light: Formation of Shadows

The expected learning outcome is that the student should appreciate

i) light "travels in a straight line".
ii) the formation of shadows.

Students will be expected to be able to:

A1 describe continuous waves and wave pulses.

A2 draw a graph of displacement against time and displacement against distance for a continuous wave.

A3 define the terms velocity, frequency, wavelength and amplitude.

A4 differentiate between waves which are transverse and those which are longitudinal.

A5 recall and use the relationship

velocity = frequency x wavelength

A6 understand what is meant by a wavefront.

A7 explain Huygens' construction and the term secondary wavelets.

A8 draw diagrams using groups of rays and wavefronts to illustrate converging, diverging and parallel pencils of rays.

A9 define the term vergence and explain the associated sign convention.

A10 define the unit for vergence.

A11 define the term curvature of a wavefront and explain the associated sign convention.

A12 distinguish between a point source and an extended source.

A13 draw a diagram showing the formation of umbra from a point source situated in front of an obstacle.

A14 draw a diagram showing the formation of umbra and penumbra from an extended source smaller than the obstacle.

A15 draw a diagram showing the formation of a shadow produced by an extended source, larger than the obstacle.

A16 solve problems by means of similar triangles or formulae to obtain the dimensions of the umbra and penumbra.

A17 draw a diagram showing the formation of the image produced by a pinhole camera.

A18 list the properties of the image produced by a pinhole camera.

A19 state what effect varying the size and shape of the pinhole will have on the image properties.

B Reflection

The expected learning outcome is that the student understands the formation of the images produced by reflection at plane and curved mirrors. Students will be expected to be able to:

B1 explain the difference between regular (specular) and diffuse reflections.

B2 define the terms incident ray, normal and reflected ray.

B3 recall the laws of reflection.

B4 construct a ray diagram showing the formation of a virtual image produced by a plane mirror.

B5 list the characteristics of the image formed by a plane mirror.

B6 solve geometrical problems on the size and position of the image produced by a plane mirror.

B7 show the relationship between the angle of rotation of a mirror and the angle of rotation of the reflected ray.

B8 derive the formula relating the angle between two inclined mirrors and the angle of deviation of the reflected ray.

B9 construct ray diagrams showing the formation of the images produced by two inclined mirrors.

B10 describe convex and concave spherical mirrors.

B11 define the terms pole (or vertex), centre of curvature, principal axis, and radius of curvature of a curved mirror.

B12 define the terms principal focus and focal length of convex and concave mirrors.

B13 derive the relationship between focal length and radius of curvature.

B14 recall the construction rays necessary to construct ray diagrams (to scale) to show the formation of images produced by curved mirrors and to use these rays to produce diagrams for the images produced by all possible positions of the object.

B15 show that there is only one type of image, for all positions of a real object, produced by a convex mirror.

B16 derive the mirror formulae.

B17 use the mirror formulae to solve numerical problems.

B18 apply the conjugate foci relationship to solve mirror problems and to recall that:

$F = -\frac{n}{f}$ or $F = -2nr$

C Refraction at a Plane Surface

The expected learning outcome is that the student appreciates that light may bend when travelling from one medium to another and can recognise the phenomenon of total internal reflection. Students will be expected to be able to:

C1 define the terms incident, normal and refracted ray, angle of incidence and angle of refraction.

C2 recall the laws of refraction.

C3 explain the terms relative refractive index and absolute refractive index.

C4 use a graphical construction for a ray trace for refraction.

C5 show that $_an_g = \frac{1}{_gn_a}$

C6 draw a diagram showing refraction produced by a parallel sided glass block.

C7 calculate the lateral and horizontal displacement produced by refraction through a parallel sided glass block.

C8 derive the general form of Snell's Law.

C9 solve problems using Snell's Law.

C10 show that refractive index of medium in air is equal to real thickness divided by reduced thickness.

C11 recall that the apparent thickness of several layers of different parallel sided media is equal to the sum of the individual reduced thicknesses.

C12 define critical angle.

C13 show that $\sin i_c = \frac{n'}{n}$

and use this to calculate various values of i_c.

C14 draw a ray diagram illustrating total internal reflection.

C15 explain the formation of a mirage and the basis of fibre optics in terms of total internal reflection.

C16 explain the terms prism, principal section of a prism, refracting faces of a prism and apical angle of a prism.

C17 construct a ray trace through a triangular prism and derive the formula:

$$d = i_1 + i'_2 - a$$

C18 use Snell's Law and the formula in C17 to calculate values of deviation for given values of incidence.

C19 use Snell's Law and recall that $a = i'_1 + i_2$ to calculate values of angle of incidence for given angle of deviation or given angle of incidence/refraction at second surface.

C20 draw a graph of angle of deviation against angle of incidence, indicating minimum deviation.

C21 recall that at minimum deviation the ray of light travels symmetrically through the prism.

C22 derive an equation for minimum deviation.

C23 use the minimum deviation equation to find n.

C24 solve numerical examples, which involve total internal reflection occurring in the prism.

C25 trace a ray through a small angled prism.

C26 draw a diagram showing the appearance of an extended object viewed through a prism (e.g. a long horizontal line parallel to the prism apex).

C27 explain in simple terms dispersion through a prism and understand the basis of chromatic aberration.

D Refraction at Curved Surfaces

The expected learning outcome is that students should understand the formation of images by converging and diverging lenses, be familiar with various lens forms and the concept of the equivalent thin lens. Students will be expected to be able to:

D1 define converging and diverging spherical refracting surfaces.

D2 define the terms vertex, centre of curvature, and principal axis of a surface.

D3 derive the fundamental paraxial equation for refraction at a single spherical surface.

D4 recall the sign convention applied to distances and angles associated with refraction at a single spherical surface.

D5 define the power of a refracting surface and recall that

$$F = (n' - n)/r$$

D6 define linear magnification and calculate its value.

D7 calculate the powers of convex and concave surfaces.

D8 calculate image position and image size by means of the fundamental paraxial equation and magnification formulae.

D9 describe the nature of an image.

D10 draw diagrams illustrating the first and second focal lengths of converging and diverging surfaces.

D11 derive Newton's Equation for a single refracting surface.

D12 use this equation to solve numerical examples.

D13 recall the construction rays necessary to draw ray diagrams to scale to show the formation of images produced by a single convex refracting surface and by a single concave refracting surface and to use these rays to produce diagrams for the images produced by all possible positions of the object.

E Thin Lenses

The expected learning outcome is that students should be able to:

E1 describe various converging lens forms and diverging lens forms.

E2 use diagrams to explain the prismatic representation of converging and diverging lenses.

E3 define the terms front vertex, back vertex, optical axis (or principal axis), centre thickness of a lens and radii of curvature of front and back surfaces, centres of curvature of front and back surface.

E4 define the term optical centre.

E5 draw diagrams showing the positions of the first and second principal focal points and the first and second focal lengths for both converging and diverging lenses.

E6 recall the construction rays necessary to draw ray diagrams to show the formation of images produced by a single thin converging or diverging lens for all possible positions of the object and describe the nature of the image.

E7 derive the conjugate foci formula for a single thin lens.

E8 derive the equation giving the power of a thin lens in air in terms of its surface curvatures or radii of curvature.

E9 recall that

$$F = \frac{-n_s}{f} \quad \text{and} \quad F = \frac{n_s}{f'}$$

where n_S is the refractive index of the surrounding medium.

E10 derive an expression for linear magnification for a single thin lens.

E11 relate the position of a single thin lens to the concept of effectivity.

E12 derive Newton's Equation for a single thin lens.

E13 appreciate that it is possible to replace a system of separated thin lenses with an equivalent thin lens.

F Photometry

The expected learning outcome is that the student should be able to:

F1 define the illuminance at a point on a surface.

F2 recall levels of illuminance required for specific job applications.

F3 recall the laws of photometry, and use the resulting equations to solve numerical problems.

F4 define the quantity reflectance and solve numerical problems involving this quantity.

F5 define transmittance of a transparent body (and be familiar with the fact that this varies according to wavelength of radiation used) and solve numerical problems involving this quantity.

G Colour

The expected learning outcome is that the student should be able to:

G1 define hue, luminosity and saturation.

G2 state the limits of the visible spectrum.

G3 relate the colour sense to wavelength, indicating approximately the 'blue, green and red' regions of the spectrum.

G4 define the terms pure and impure colour, vivid and pastel shades and bright and dark colours.

G5 define primary and complementary colours.

Theory of Ophthalmic Lenses

Unit 2

A Interpupillary and Centration Distances

The expected learning outcome is that the student should be able to describe how to measure interpupillary distance, binocular and monocular, and near centration distance. Students will be expected to be able to:

A1 define interpupillary distance [PD].

A2 define near centration distance [NCD].

A3 explain, with diagrams, how to measure the distances A1 and A2.

A4 explain how to measure the PD of a patient with strabismus.

A5 calculate an NCD if only a distance PD was measured.

B Lens Manufacture and Data

The expected learning outcome is that the student should appreciate the different types of materials used in lens manufacture. They should be aware of some of the important physical properties of the material, (ie: density, V value, refractive index, curve variation factor). Students will be expected to:

B1 describe the important physical properties of the various materials from which specific lenses are made.

B2 give typical values for the various physical properties of the materials used for ophthalmic lenses.

B3 list the advantages and disadvantages of the various glasses and plastics.

C Lens Form

The expected learning outcome is that the student understands the changes in vergence associated with a thin ophthalmic lens and comprehends the various forms in which such a lens may be manufactured. Students will be expected to:

C1 define a spherical lens.

C2 indicate on a diagram, with radii of curvature marked, converging and diverging forms of a spherical lens.

C3 use thin lens theory to derive the expression for the power of a thin lens:

$F = (n'-n)\ (1/r_1 - 1/r_2)$

C4 use the relationship in C3 or individual surface power formulae to calculate:

equi-convex, plano-convex, meniscus, equi-concave and plano concave lens forms

C5 know what is meant by the term base curve as applied to the form of an ophthalmic lens.

C6 know what is meant by the terms flat and curved as applied to the form of an ophthalmic lens.

C7 recall the formula for surface power and use it to calculate the required marked surface power of a tool to produce a specified surface power made from a medium other than that for which the tools are calibrated.

D Parameters of Sphero-cylindrical lenses

The expected learning outcome is that the student will appreciate what is meant by a flat astigmatic lens and, with the aid of diagrams, be able to:

D1 define a cylindrical surface.

D2 define the terms principal meridians and power meridians.

D3 state what is meant by standard axis notation.

D4 write a lens power in crossed cylinder form, or sph-cyl form, the latter being in either plus or minus cyl form.

D5 transpose from one form of prescription to another.

D6 solve numerical calculations involving several flat thin astigmatic lenses with compatible axes in contact.

E Parameters of Toric Lenses

The expected learning outcome is that the student will be able to distinguish between the different forms of toric lenses and appreciate their function. Students will be expected to be able to:

E1 define the term toroidal surface.

E2 describe the terms tyre, barrel and capstan, as applied to a toroidal surface.

E3 define the terms base curve and cross curve, as applied to a toroidal surface.

E4 specify a toroidal surface in terms of its base curve and cross curve.

E5 define the term toric lens.

E6 explain what is meant by a plus base toric lens and a minus base toric lens.

E7 specify a toric lens in terms of a base curve, a cross curve and a sphere curve.

E8 transpose from one type of toric lens:
a) onto a given base curve (plus or minus)
b) onto a given sphere curve (plus or minus)

E9 transpose from a given toric form into cross cylinder or sphere/cyl form.

F Line Foci and Disc of Least Confusion

The expected learning outcome is that the student recognises the formation of images produced by an astigmatic lens and will be able to:

F1 draw a diagram showing the nature of the pencil refracted by a cylindrical lens.

F2 draw a diagram showing the nature of the pencil produced by a sph-cyl lens.

F3 derive the vergence formulae used to locate the positions of the line foci, the length and direction of the line foci, and the position and diameter of the disc of least confusion.

F4 use the formula from F3 to solve numerical calculations on astigmatic pencil problems.

F5 use thin lens theory to calculate the prescription of a thin lens, placed in contact with a given astigmatic lens, to give a specified type of image in a specified plane.

G Lens Measure and Lens Thickness

The expected learning outcome is that the student appreciates the use of the lens measure and is able to relate edge and centre thickness with a given lens prescription, and will be expected to be able to:

G1 explain the structure and associated theory of the lens measure.

G2 explain how to use the lens measure.

G3 calculate a surface power for materials other than that for which the measure is calibrated.

G4 derive both the accurate and approximate sag formulae.

G5 calculate edge thickness and thickness at the geometrical centre or optical centre for:
a) spherical lenses
b) astigmatic lenses
c) the above lenses combined with prism or decentration.

H Ophthalmic Prisms and Prismatic Effects

The expected learning outcome is that the student will, for ophthalmic prisms and prismatic effects, be able to:

H1 define the terms:
a) refracting edge
b) principal section
c) apical angle

H2 derive the relationship for a small angled prism:
$d = (n-1)a$

H3 define the prism dioptre.

H4 use the relationships of H2 and H3 to solve numerical examples on deviation (in degrees or prism dioptres) produced by a small angled prism.

H5 use the 360 notation to specify the base setting of a prism.

H6 describe how to construct a tangent scale capable of measuring the:
a) power of a prism in prism dioptres
b) deviation produced (in degrees)
c) apical angle (in degrees)

H7 describe how to locate and mark a line joining apex to base of a plano prism.

H8 derive the prism thickness difference formula

$$g = \frac{P.d}{100(n-1)}$$

H9 use the equation from H8 to solve numerical examples.

H10 compound any number of prisms into a single resultant.

H11 resolve a single prism into two components using either a graphical method or calculation.

H12 split prism power between the two eyes.

H13 solve numerical examples based on H10 – H12.

H14 describe the action of the Rotary Prism (Risley Prism).

H15 derive the expression known as Prentice's Rule $P=cF$

H16 use Prentice's Rule to calculate the magnitude and direction of the prismatic effect at any point on a lens. Either the decentration or the distance of the point from the optical centre of the lens may be given. The lenses specified may be positive or negative spheres, plano-cyls or sph-cyl (but with the cylinder axis restricted to 90 and 180). The prismatic effect may be required as a single resultant value or as vertical and horizontal components.

H17 use Prentice's Rule to calculate the magnitude and direction of decentration required to produce a specified amount of prism for a given prescription for the types of lenses listed in H16. The decentration may be required as a single resultant value or as vertical and horizontal components.

H18 calculate the minimum size uncut required using the stated horizontal lens size and the single decentration as calculated in H17, limited to round and/or oval lenses.

H19 explain what is meant by differential (relative) prism.

H20 find the differential prism for a pair of lenses (for astigmatic lenses, axes will be restricted to 90 and 180).

J Elements of Ametropia

The expected learning outcome is that the student will understand the terms used to describe the elements of ametropia and be able to:

J1 define ametropia, emmetropia, myopia and hypermetropia.

J2 define and represent on a diagram the far point of a reduced eye.

J3 draw diagrams, showing the positions of the far point and the spectacle lens second focal point, which demonstrate how spherical ametropia is corrected.

J4 define vertex distance and spectacle distance and their significance for high lens powers.

J5 calculate effective powers with spectacle lenses at different vertex distances.

Ophthalmic Dispensing Practice

Unit 3

A1 Lens Measure

The expected learning outcome is that the candidate should be able to:

A1.1 test a lens measure for zero error.

A1.2 locate, measure and record the base curve, cross curve and sphere curve on a toric lens.

A2 Single Vision Focimetry

The expected learning outcome is that the candidate should, for spherical and astigmatic lenses as appropriate, be able to:

A2.1 locate and mark the optical centre of a lens.

A2.2 measure and record the power of a spherical lens.

A2.3 measure and record the prescription of an astigmatic lens.

NB: The learning outcomes in A2 must be achieved using a telescope type focimeter.

A3 Hand Neutralisation

The expected learning outcome is that the candidate should, for spherical and astigmatic lenses as appropriate, be able to:

A3.1 recognise transverse movement.

A3.2 recognise scissors movement.

A3.3 locate and mark the principal meridians of a lens.

A3.4 locate and mark the optical centre of a lens.

A3.5 neutralise by hand and record the power of a spherical lens.

A3.6 neutralise by hand and record the prescription of an astigmatic lens.

B1 Frame Measurements

The expected learning outcome is that the candidate should be able to locate, measure and record for fixed pad bridge frames, regular bridge frames and frames with pads on arms as appropriate:

1) Distance between box centres
2) Box lens size
3) Distance between lenses
4) Distance between rims
5) Bridge width
6) Bridge height
7) Crest height
8) Apical radius
9) Projection
10) Distance between pad centres
11) Splay angle of pad
12) Frontal angle of pad
13) Angle of side
14) Length to bend
15) Length of drop
16) Downward angle of drop
17) Total length of side
18) Length to tangent
19) Frame head width
20) Frame temple width
21) Let-back of side

B2 Facial Measurements

The expected learning outcome is that the candidate should be able to locate, measure and record:

1) The interpupillary distance
2) Monocular pupillary distances
3) Crest height
4) Bridge projection
5) Apical radius
6) Distance between rims at 10mm and 15mm below crest
7) Frontal angle
8) Splay angle
9) Front to bend
10) Head width

C1 Frame Adjustments and Tools

The expected learning outcome is that the candidate should be able to:

C1.1 determine the need for adjustments and the order in which they should be carried out.

C1.2 demonstrate the handling and adjustment of all types of spectacle frames and materials.

C1.3 identify tools used in the repair, adaption and adjustment of spectacle frames.

C1.4 explain any safety issues surrounding the use of tools.

C1.5 demonstrate the use of tools.

C2 Frame Construction and Materials

The expected learning outcome is that the candidate should be able to:

C2.1 identify current and obsolete spectacle frame materials.

C2.2 recall the terms used in the construction of spectacle frames.

C2.3 describe the construction of spectacle frames and mounts designed for adults and for children.

C2.4 describe the raw materials used in spectacle frame manufacture.

D Single Vision Prescription Analysis and Communication Skills

The expected learning outcome is that the candidate should, at preliminary level, be able to:

D1 analyse and interpret verbal, non-verbal and written information.

D2 demonstrate effective questioning and listening skills.

D3 identify incomplete, inaccurate and ambiguous prescriptions.

D4 recall spectacle lens data and availability.

D5 suggest suitable lens types for a given prescription.

D6 explain the relationship between prescriptions for different distances.

D7 explain the use of terms relating to spherical and astigmatic ametropia.

D8 explain why and how prismatic correction may be included in a prescription.

D9 describe mechanical and optical properties of spectacle lenses.

D10 describe tints, coatings and lens treatments.

D11 identify where personal eye protection may be required.

D12 discuss lenses suitable for personal eye protection.

Theory of Ophthalmic Dispensing

Unit 4

1. Fields of View

The expected learning outcome is that the student should understand the limitations imposed on an ametrope's field of vision and be able to:

1.1 explain the field of vision of the eye and the field of fixation.

1.2 describe factors affecting the field of view of spectacle lenses.

1.3 describe and calculate the extent of the apparent field of view and real field of view.

1.4 describe the Jack-in-the-box effect.

1.5 determine the ocular rotation of the eye when viewing distant and near objects through thin correcting lenses.

2. The Use of Tinted and Protective Lenses

The expected learning outcome is that the student should recognise where general safety and protection from harmful radiations are important in patient welfare and be able to:

2.1 explain the use of transmission curves for a range of glasses, plastics and filters.

2.2 advise on the use of types of tints for specific applications.

2.3 describe photochromic filters.

2.4 describe the formation of reflections and ghost images from spectacle lenses.

2.5 calculate surface reflectance.

2.6 describe methods of reducing unwanted reflections.

2.7 describe the principles of impact resistant lenses and their application.

2.8 recall the general provisions of EN166-168 and test procedures.

2.9 define plane polarised light and explain how it may be produced.

2.10 explain the significance of the Brewster angle.

2.11 describe the manufacture and use of polarising spectacles.

2.12 describe the manufacture and application of hydrophobic and scratch resistance coatings.

2.13 describe how single and multi-layer anti-reflection coatings can be applied to a spectacle lens.

3. Multifocal Lenses

The expected learning outcome is that the student should be able to dispense multifocal spectacle lenses safely and appropriately, and:

3.1 define terms used to locate and measure bifocals.

3.2 recall the significance of distance and near visual points.

3.3 describe the mechanical requirements of bifocals.

3.4 describe the optical requirements of bifocals.

3.5 explain jump and the criterion for no-jump bifocals.

3.6 calculate jump in any bifocal lens.

3.7 determine the position of the optical centre of the near portion.

3.8 explain how differential prism at the NVP may be controlled.

3.9 explain the use of split bifocals, cement bifocals, upcurve bifocals and bonded bifocals.

3.10 describe fused bifocals, their method of manufacture and use.

3.11 describe solid invisible and visible segments, solid prism segment bifocals and blended bifocals and their method of manufacture.

3.12 describe types of lenticular bifocals.

3.13 explain the need for multifocal and progressive power lenses.

3.14 determine the intermediate addition for a given range of vision.

3.15 describe types of trifocals available and explain their advantages and disadvantages.

3.16 describe types of progressive power lenses and explain the advantages and disadvantages of the progression zone.

3.17 sketch a typical graph showing the power variation through the progression zone for designs with linear power laws and non-linear power laws and describe the variation in radius along the umbilic line for these designs.

3.18 sketch and describe the regions of indistinct vision for both hard and soft progressive power surfaces.

3.19 describe and explain the recommended markings found on a typical progressive power lens.

4. Special Lenses

The expected learning outcome is that the student should be able to identify situations where special types of lenses may be required, and be able to:

4.1 describe and explain the principles of the following:

a) lenses for use under water
b) recumbent prisms
c) Fresnel lenses
d) Fresnel prisms
e) chavasse lenses
f) frosted lenses
g) occluders

5. Eyes at Work

The expected learning outcome is that the student should understand the need to supply the correct optical appliance for a specific task, and be able to:

5.1 analyse aspects of the visual task.

5.2 describe illuminance, luminance, refractive errors, presbyopia, binocular vision anomalies and glare as factors affecting vision in the work environment.

5.3 describe asthenopia and its symptoms.

5.4 describe aspects of the workplace, which may contribute to factors affecting vision.

6. Dispensing High Powers

The expected learning outcome is that the student should understand the optical, mechanical and cosmetic problems, which are likely to arise when dispensing high power spectacle lenses, and be able to:

6.1 identify where reduced aperture lenses may be beneficial.

6.2 describe types of lenticular and blended lenticular lenses.

6.3 appreciate the effects of high power cylinders on lens thickness.

6.4 explain the need for accurate centration.

6.5 describe the effects of aspherising lens surfaces.

6.6 explain the link between reduced thickness and increased refractive index.

6.7 describe the aberrations, which may become apparent in high powers and how these may be reduced.

6.8 explain the significance of frame fitting and vertex distance.

7. Facial and Frame Measurements

The expected learning outcome is that the student should be able to:

7.1 understand and be able to recall the British Standards definitions of facial and frame measurements.

7.2 appreciate how to take and record the relevant information for adults and children.

Advanced Theory of Ophthalmic Lenses

Unit 5

1. Prismatic Effect

The expected learning outcome is that the student should understand the significance of prismatic effects at any point on a lens, compare prismatic effects in two eyes, and should able to:

1.1 find either graphically or by calculation the magnitude and direction of the effect at any point on a lens. Either the decentration or the distance of the point from the optical centre of the lens may be given. The prismatic effect may be required as a single resultant value or as vertical and horizontal components.

1.2 find either graphically or by calculation the magnitude and direction of decentration required to produce a specified amount of prism for a given prescription. The decentration may be required as a single resultant value or as vertical and horizontal components.

1.3 calculate the amount of prism to be slabbed-off and discuss the thickness difference in Bi-centric lenses.

1.4 determine the prismatic effect at the near visual point on a (bifocal) lens.

1.5 calculate and explain the significance of differential prism in bifocal lenses.

2. Cylindrical Lenses

The expected learning outcome is that the student should recognise the significance of cylindrical powers on lens thickness, and the need to combine cylindrical powers, and be able to:

2.1 calculate notional cylindrical powers.

2.2 calculate the thickness of astigmatic lenses along oblique meridians of a lens with a cylindrical or a toroidal surface.

2.3 locate the thinnest point of the edge of an astigmatic lens.

2.4 sum obliquely combined cylinders either by formulae or by graphical means.

3. Lens Thickness in High Powers

The expected learning outcome is that the student should understand the parameters and limitations of high power spectacle lenses, and be able to:

3.1 recall the relationship between the aperture diameter and the thickness of a lenticular lens.

3.2 calculate the edge thickness for a given concave lenticular aperture.

4. Effectivity, Vertex Powers and Accurate Transposition

The expected learning outcome is that the student should understand effective powers and vergences, be able to solve problems relating to thick spectacle lenses, and be able to:

4.1 calculate the effective power of a lens.

4.2 calculate prescription modifications to account for differing vertex distances.

4.3 recall the use of back vertex powers to number spectacle lenses.

4.4 transpose lens forms taking thickness into account.

4.5 explain front and back surface compensation.

4.6 calculate vertex power allowances.

4.7 explain near vision effectivity error.

4.8 describe ophthalmic trial lens types and the suitability of trial lenses for refraction and neutralisation.

4.9 explain how vertex powers and the vergence impressed by spectacle lenses in near vision in multifocal lenses can be measured using a focimeter.

4.10 calculate target movement and the power of the standard focimeter lens.

4.11 calculate spectacle magnification using the shape factor and power factor.

4.12 calculate the form and thickness of afocal iseikonic lenses.

5. Aberrations and Spectacle Lens Design

The expected learning outcome is that the student should understand that the quality of images is variable and dependent on design factors, and be able to:

5.1 define the difference between paraxial and finite ray tracing.

5.2 expand the sine function and recall what is meant by first order approximation.

5.3 describe spherical aberration and its influence on the paraxial theory of ophthalmic lenses.

5.4 describe and calculate transverse chromatic aberration for single vision lenses.

5.5 describe tangential and sagittal planes of refraction, the astigmatic pencil, teacup and saucer diagrams, image shell diagrams and the variation in oblique astigmatism with stop position and form of lens.

5.6 describe curvature of field and the Petzval surface, and calculate the radius of curvature of the Petzval surface.

5.7 describe pincushion and barrel distortion and the significance of distortion adaptation to new spectacles.

5.8 explain the criterion for a best form spectacle lens.

5.9 describe image shell diagrams for plus and minus point-focal lenses, plus and minus Percival lenses and plus and minus lenses which exhibit minimum tangential error.

5.10 explain the significance of oblique vertex sphere powers and image vergences.

5.11 explain oblique astigmatic error, mean oblique power and mean oblique error.

5.12 describe conicoidal surfaces (ellipsoids, paraboloids and hyperboloids).

5.13 describe the surface astigmatism of a conicoid and how this can be used to combat aberrational astigmatism.

5.14 calculate the thickness of a lens with a conicoidal surface.

5.15 describe polynomial surfaces and blended zonal aspheric surfaces.

5.16 discuss the significance of wavefront aberrations and transfer function.

6. Tinted Lenses

The expected learning outcome is that the student should appreciate the need to protect the eyes from harmful radiations, and be able to:

6.1 describe sources of radiation and the effect upon the various components of the eye.

6.2 recall wavelength transmittance of the ocular media.

6.3 explain spectral transmittance and luminous transmittance.

6.4 explain how transmission curves are constructed.

6.5 describe methods of producing tinted lenses.

6.6 describe the difference between constructive and destructive interference.

6.7 explain path length and amplitude conditions for producing destructive interference.

Professional Conduct in Ophthalmic Dispensing

Unit 6

The expected learning outcome is that the student must have an understanding and working knowledge of the relevant legislation and civil laws, as well as codes of conduct and professional guidance to be able to care for, respect and protect the rights, dignity, privacy and confidentiality of patients. Students will be expected to be able to:

1. describe how to manage a patient's care in a safe, ethical and confidential environment.

2. explain how to keep clear, accurate and contemporaneous patient records, which record all relevant findings and decisions made.

3. understand and demonstrate a working knowledge of health care delivery systems.

4. describe how to manage patients who have additional clinical or social needs.

5. interpret and respond appropriately to patient records and other relevant information.

6. demonstrate how to work within a multi-disciplinary team.

7. recall the guidelines and codes set for the profession.

8. explain the importance of their legal and ethical responsibilities in relation to the publication, advertising and broadcasting information of services, facilities and goods.

9. devise clear, accurate and contemporaneous records of financial transactions relating to fees and vouchers and other financial information.

10. describe basic business management and financial accounting techniques.

11. provide information about payment of fees and other costs relevant to patients needs and wants.

12. demonstrate a knowledge and understanding of professional guidance in relation to conflicts of interest.

13. state the implications of current UK and European legislation relevant to the dispensing of optical appliances.

14. explain the significance of Health and Safety legislation in the workplace, and how it applies for themselves as employees and for patients.

15. recall current legislation regarding professional and practice indemnity insurance.

Communications in Ophthalmic Dispensing

Unit 7

The expected learning outcome is that the student should be able to demonstrate the ability to seek and communicate relevant information from and to patients in an effective and appropriate manner. Students will be expected to be able to:

1. demonstrate communication effectively with the patient using verbal, non-verbal and written skills.

2. explain how to take into consideration the patients' physical, emotional, intellectual and cultural background.

3. take accurate history from patients with a range of ophthalmic problems and needs.

4. demonstrate how to deal effectively with patient concerns and complaints.

5. explain the importance and significance of family history, signs and symptoms.

6. explain the importance of the patient's health status, medication, work, sports, lifestyle and special skills to ophthalmic dispensing.

7. demonstrate appropriate communication skills when discussing ophthalmic matters with patients, taking into account relevant individual characteristics.

8. explain how to deal with patients' fears, anxieties and concerns about their visual welfare in the eye examination and its outcome.

9. discuss how to deal with a patient who needs information about systemic disease and its ocular impact, its treatment and the possible ocular side effects of medication.

10. describe how to recognise the patient's expectations and aspirations and managing situations where these cannot be met.

11. describe how to communicate with patients who have poor or non-verbal communication skills, or those who are confused, reticent or misled.

The Assessment and Management of Refractive Errors

Unit 8

1. Stops and Fields of View

The expected learning outcome is that the student should be able to relate the functions of the human eye to the limits of resolution, and be able to:

1.1 define entrance and exit pupils.

1.2 relate entrance and exit pupils to the pupils in the eye and to optical instruments.

1.3 explain Fraunhofer diffraction; the Airy disc; resolving power; Rayleigh's criterion; Fresnel diffraction and diffractive lenses.

2. Terminology

The expected learning outcome is that the student should be able to recall:

2.1 anatomical planes and terms.

2.2 the terms used to identify anatomical planes.

2.3 the terms used to locate a structure's position relative to another structure.

3. Systems

The expected learning outcome is that the student should be aware of how systems relate to anatomical structures, and be able to describe:

3.1 the structure, functions and location of epithelial tissue, connective tissue, muscle tissue and nervous tissue.

3.2 the structure and functions of blood vessels.

3.3 the terms somatic, autonomic, motor, sensory, central and peripheral, as they apply to the nervous system.

4. The Eye and Ocular Adnexa

The expected learning outcome is that the student should be able to describe the location, function, gross structure, layers, nerve supply, sources of nutrition, waste product removal, and be able to draw, as appropriate, a section through:

4.1 the cornea, and recall values for radii of curvature and refractive index.

4.2 the sclera, and recall factors affecting its appearance.

4.3 the limbal region, trabecular meshwork and canal of Schlemm.

4.4 the iris.

4.5 the ciliary body and its involvement in accommodation.

4.6 the choroid.

4.7 the retina.

4.8 the optic nerve.

4.9 the crystalline lens, and recall values for radii of curvature and refractive index.

4.10 the conjunctiva.

4.11 the eyelids.

4.12 the lacrimal system.

4.13 the extrinsic oculorotatory muscles.

4.14 the aqueous and vitreous humours.

4.15 the visual pathway.

5. Pharmacology

The expected learning outcome is that the student should be able to describe ophthalmic drugs under the following headings:

5.1 Types of ophthalmic drugs and topical preparations

5.2 Modes of action

5.3 Dosage

5.4 Functions and effects

5.5 Regulations affecting use and storage of ophthalmic drugs in ophthalmic practice

6. Systemic Disorders

The expected learning outcome is that the student should be aware that certain systemic disorders could have effects on the visual system.

7. Spectacle Anatomy

The expected learning outcome is that the student should understand the link between anatomical structures and spectacle frame fitting, and be able to:

7.1 describe the structure of skin in the nasal and aural areas.

7.2 describe the facial sensory nerve supply.

7.3 recall types of skin allergy and other conditions, which relate to spectacle fitting.

7.4 explain the effects of pressure on the skin and underlying structures.

7.5 describe facial prostheses as they relate to spectacle fitting.

8. Optics of the Eye, Ametropia, and its Correction

The expected learning outcome is that the student should, with regard to refractive errors, be able to:

8.1 describe Gullstrand's simplified schematic eye and its equivalent surface.

8.2 describe Emsley's 60D standard reduced emmetropic eye and non standard reduced emmetropic eyes.

8.3 explain emmetropia and ametropia in real eyes, the simplified schematic eye and the reduced eye.

8.4 explain spherical ametropia (myopia and hypermetropia), axial, curvature and index ametropia in schematic, reduced and real eyes, the growth of the human eye in emmetropia, spherical ametropia and progressive myopia.

8.5 describe the correction of spherical ametropia in the reduced eye with a thin lens.

8.6 define ocular refraction, spectacle refraction and vertex distance and use equations relating to them.

8.7 describe, and use equations relating to, the formation of clear and blurred retinal images in the unaccommodated and accommodated reduced eye, corrected by a thin or thick lens.

8.8 explain spectacle magnification relating to the reduced eye.

8.9 calculate the size of retinal images formed by a near object.

8.10 describe, and use equations relating to, spectacle and ocular accommodation with the reduced eye corrected by a thin or thick lens.

8.11 compare the correction of spherical ametropia with contact lenses and spectacle lenses.

8.12 define relative spectacle magnification and describe the effect of axial length and corneal power induced ametropias on the retinal image size.

8.13 describe the classification and correction of astigmatism in the reduced, simplified schematic and human eye.

8.14 explain irregular refraction.

8.15 be aware of refractive surgical procedures.

9. Accommodation

The expected learning outcome is that the student should be able to:

9.1 recall theories of accommodation and how the lens changes during accommodation.

9.2 describe the stimulus to accommodation.

9.3 explain empty field myopia, night myopia and instrument myopia.

9.4 describe amplitude and range of accommodation.

9.5 describe presbyopia, its causes and the near addition.

9.6 explain facultative, absolute, manifest and latent hypermetropia.

9.7 explain the link between accommodation and juvenile stress myopia.

9.8 describe clinical aspects of aphakia and psuedophakia and their correction.

10. Ophthalmic Instruments

The expected learning outcome is that the student should be able to describe and explain the use of:

10.1 the duochrome test.

10.2 the fan and block and associated subjective routine.

10.3 the cross cylinder and associated subjective routine.

10.4 distance and near test types, including those specifically designed for paediatric use.

10.5 the retinoscope.

10.6 subjective and objective optometers.

10.7 direct and indirect ophthalmoscopes.

10.8 the slit lamp.

10.9 the keratometer.

11. Eye Movements

The expected learning outcome is that the student should understand the significance of co-ordinated eye movements in terms of refractive management, and be able to:

11.1 explain primary, secondary and tertiary positions of gaze, the actions of individual muscles and the mechanism of oculorotation.

11.2 explain terms used to describe binocular movements.

11.3 describe the link between convergence and accommodation and calculate the convergence through centred and decentred spectacle lenses.

12. Vision

The expected learning outcome is that the student should understand the basis upon which standards of vision are described and classified, and be able to:

12.1 explain the Duplicity Theory of Vision and dark adaption.

12.2 explain the appearance and causes of entoptic phenomena.

12.3 define visual acuity and resolution acuity.

12.4 describe methods of measuring and recording visual acuity.

13. Coding in the Visual System

The expected learning outcome is that the student should be able to:

13.1 describe methods of measuring the extent of monocular and binocular visual fields

13.2 define monocular and binocular amblyopia, strabismic, anisometropic, stimulus deprivation (amblyopia ex anopsia), congenital and organic types and meridional amblyopia.

13.3 explain the theories of colour vision and the classification of and tests for defects in colour perception.

14. Visual Perception

The expected learning outcome is that the student should, with regard to monocular and binocular vision, be able to:

14.1 explain monocular and binocular depth perception.

14.2 explain physiological diplopia.

14.3 describe stereopsis and the adaptation to perceived distortion of stereoscopic space.

15. Anomalies of Binocular Vision

The expected learning outcome is that the student should understand how muscle imbalance may be significant in maintaining binocular single vision, and be able to:

15.1 recall grades of binocular vision.

15.2 define orthophoria.

15.3 define and classify heterophoria and heterotropia.

15.4 describe anomalies of accommodation and convergence.

15.5 describe the detection and measurement of heterophoria.

16. Ocular Conditions

The expected learning outcome is that the student should, for a range of significant ocular diseases and disorders:

16.1 understand clinical treatments available.

16.2 be aware of surgical procedures.

16.3 be aware of vitamin and mineral supplements that may be beneficial.

Low Vision in Ophthalmic Dispensing

Unit 9

The expected learning outcome is that the student should appreciate the expectations and requirements of low vision patients, and be able to:

1. define vision, low vision, visual acuity and visual field.
2. consider criterion for visually impaired/severely visually impaired registration and the appropriate forms, and to consider statutory and non-statutory benefits of registration.
3. consider the effectiveness of current refraction.
4. compare types of test charts used for distance and near vision and discuss their uses, advantages and disadvantages.
5. understand the criteria for referral for a new prescription.
6. consider the use of contact lenses for patients with low vision.
7. understand the terms related to monocular and binocular contrast sensitivity.
8. describe the factors affecting contrast sensitivity and the clinical tests used to assess it.
9. understand the effects of contrast filters and other methods of improving contrast.
10. consider the effects of illumination and low contrast sensitivity on vision and visual acuity.
11. consider types of lamps and positioning of light sources and the relevance of discomfort and disability glare.
12. understand the reasons for reduced near vision acuity.
13. understand the assessment of visual fields and visual pathway.
14. be aware that systemic pathology may affect vision, visual acuity and visual fields.
15. understand the indications for binocular and monocular appliances, including use of occlusion.
16. understand the method of paraxial ray tracing through a thick lens or system of lenses, including telescopic systems and calculate magnifying power in afocal and non-afocal settings.
17. define and calculate linear, nominal and angular magnification for a simple magnifier or lens system.
18. estimate magnification required (with use of Snellen acuities) for distance, and near vision and any other relevant distances.
19. discuss types of optical aids for different visual tasks.
20. be aware of British and International standards for low vision aids.
21. consider the design, availability and suitability of non-optical aids including CCTV, TV reader systems and field expanders.
22. discuss training in the use of aids.
23. understand the aftercare management of low vision patients, including the frequency of aftercare visits required.
24. consider the psychology of low vision.
25. discuss the role of other health care professionals and support groups in the low vision field, the ability to refer and the advantages of working in a multi-disciplinary team.

The Principles of Contact Lens Wear

Unit 10

The expected learning outcome is that the student should appreciate the basic principles of contact lens work, and be able to:

1. describe the differences between RGP, soft and scleral contact lenses.

2. know the advantages and disadvantages of fitting a patient with RGP, soft or scleral contact lenses.

3. discuss the advantages and disadvantages of the different materials from which contact lenses can be manufactured.

4. compare the advantages and disadvantages of contact lens wear with spectacle lens wear.

5. know, at foundation level, the therapeutic uses of contact lenses.

6. consider the uses of contact lenses for patients with low vision.

7. understand, at foundation level, the choice of contact lens parameters and fitting philosophies for both RGP and soft lens patients.

8. consider the factors affecting contact lens design.

9. discuss the different techniques for the insertion and removal of all types of contact lenses.

10. discuss the purposes and types of contact lens care regimes and understand the common constituents of the solutions used.

11. understand the purposes and requirements of wearing schedules and aftercare visits.

12. know the content of an initial assessment and of an aftercare consultation.

13. understand, at foundation level, the management of contact lens aftercare issues.

14. understand the signs, symptoms and differential diagnosis of serious contact lens complications.

15. know the management options of serious contact lens complications.

16. understand the legal and ethical matters relating to contact lenses.

Advanced Ophthalmic Dispensing Practice

Unit 11

A1 Spectacle Checking

The expected learning outcome is that the candidate should, for bifocal lenses, be able to:

A1.1 verify that lenses have been produced to a given prescription.

A1.2 verify that all aspects of the spectacle frame or mount are correct.

A1.3 verify that lenses have been correctly positioned in a spectacle frame or mount.

A2 Spectacle Duplication

The expected learning outcome is that the candidate should be able to:

A2.1 provide all aspects of a pair of progressives in order to duplicate the lenses.

A3 Spectacle Lens Identification and Refractive Index Calculation

The expected learning outcome is that the candidate should be able to:

A3.1 provide a written description of a spectacle lens.

A3.2 calculate the refractive index of a single vision spectacle lens.

A4 Manual Skills Task

The expected learning outcome is that the candidate should be able to demonstrate their ability to manipulate and repair spectacle frames.

In order to demonstrate these skills, candidates must carry out two of the following tasks:

a) Spring in lenses and set up frame.

b) Shorten a metal side by cutting and re-bending.

c) Remove a broken nylon cord, replace and refit lens.

d) Increase the angle of let-back on a plastics frame by filing.

e) Replace faulty components on a compression plug rimless mount.

f) Adjust a metal frame eyerim to accommodate high plus lenses or lenses made with a high plus front curvature.

B1 Spectacle Dispensing

The expected learning outcome is that the candidate should be able to:

B1.1 measure and record details for a handmade, regular bridge frame.

B1.2 measure and record details for a plastics fixed pad bridge frame.

B1.3 measure and record details for a frame with pads on arms.

B1.4 recall British and European standards relating to frame and lens measurements.

B1.5 explain how changing frame measurements may affect the overall fitting.

B1.6 explain how and when additional lens measurements are required and their significance.

B2 Special Optical Appliances

The expected learning outcome is that the candidate should be able to:

B2.1 discuss a variety of suitable low vision appliances for given scenarios.

B2.2 give advice to patient on the use of special optical or low vision appliances.

B2.3 discuss suitable special optical appliances for a given scenario.

C Prescription Analysis

The expected learning outcome is that the candidate should be able to:

C1 interpret and explain aspects of patient case records.

C2 discuss the taking and recording of relevant information.

C3 explain how decisions are made in determining products dispensed and services provided.

C4 suggest and justify alternative ways of dispensing prescriptions.

Case records may include the following topics for single vision, bifocal, trifocal and progressive power lenses, as appropriate:

- Paediatric (including pre-school) dispensing
- Complex prescriptions
- Occupational dispensing
- Sports eyewear dispensing
- Gross anisometropia
- Prescribed tints
- Prescribed prisms
- Personal eye protection
- Low Vision – to include referral procedure

D Abnormal Ocular Conditions

The expected learning outcome is that the candidate should be able to:

D1 recognise ocular pathological conditions

D2 explain what action a GOC Registered Dispensing Optician should take when presented with an ocular pathological condition.

D3 explain when and to whom any referral should be made.

D4 recognise where emergency action may be needed.

D5 record all relevant information relating to a referral.

D6 recall the legal obligations of a GOC Registered Dispensing Optician in caring for patients.

E Communication Skills

The expected learning outcome is that the candidate should be able to:

E1 demonstrate how to communicate effectively when dealing with patient complaints.

E2 explain how to deal with patient's fears, anxieties and concerns about their visual welfare.

E3 describe how to recognise the patient's expectations and aspirations and how to manage the situations where these cannot be met.

F Assessment of Portfolio

The expected learning outcome is that the candidate should be able to:

F1 demonstrate their ability to produce clear and legible case records.

F2 produce the correct number of each type of prescription and scenario, as laid down in the PQP guidelines.

Practical Examinations

Unit 3 Ophthalmic Dispensing Practice

Preliminary Qualifying Examination Practical . . . . . .Year 1

Unit 11 Advanced Ophthalmic Dispensing Practice

Final Qualifying Examination Practical . . . . . .Year 3

Order of Examinations

Year	Unit	Title
Preliminary Qualifying Examination		
1	1	Theory of General Optics
1	2	Theory of Ophthalmic Lenses
1	3	Ophthalmic Dispensing Practice
Final Qualifying Examination		
2	4	Theory of Ophthalmic Dispensing
2	5	Advanced Theory of Ophthalmic Lenses
2	6	Professional Conduct in Ophthalmic Dispensing
2	7	Communication in Ophthalmic Dispensing
3	8	The Assessment and Management of Refractive Errors
3	9	Low Vision in Ophthalmic Dispensing
3	10	The Principles of Contact Lens Wear
3	11	Advanced Ophthalmic Dispensing Practice

Preliminary Qualifying Examination – Practical

A Single Vision Lenses (1 hour)

Candidates will be required to complete the following tasks and record the information:

A1 Use a lens measure to find the base curve, cross curve and sphere curve on two uncut lenses.

A2 Use a focimeter to find the powers of a pair of glazed toric lenses, locate the vertical position of the optical centres and the optical centre distance.

A3 Hand neutralize a pair of spectacles glazed with toric lenses, locate the vertical position of the optical centres and the optical centre distance.

B Frame and Facial Measurements (45 minutes)

Candidates will be required to measure and record:

B1 a range of measurements for a fixed pad bridge frame, regular bridge frame and a frame with pads on arms.

B2 a range of facial measurements.

C Frames And Tools (45 minutes)

Candidates will be required to demonstrate their ability to:

C1 adjust spectacle frames and mounts and demonstrate the use of various tools.

C2 identify and describe types of frame construction and materials

D Single Vision Prescription Analysis and Communication Skills (30 minutes)

Candidates will be required to demonstrate, at preliminary level, their ability to discuss and interpret a variety of prescriptions and prescribers' comments.

Final Qualifying Examination – Practical

Section A – Lenses and manual skills (1¼ hours)

A1 Spectacle Checking (15 minutes)

Candidates will be required to complete the following tasks and record any information required.

Check the following items for a spectacle frame glazed with bifocal lenses against a written order:

a) spherical power
b) cylindrical power
c) axis
d) addition
e) the magnitude and direction of any prismatic element
f) segment size and shape
g) segment top position
h) geometric inset
i) any additional features relating to the lenses
j) frame details and measurements

A2 Spectacle Duplication (15 minutes)

Candidates will be required to complete the following tasks and record any information required.

Candidates will be expected to record the following measurements in order for a pair of spectacles glazed with progressive power lenses to be duplicated:

a) identify type of progressive power lens from a list of engravings given
b) spherical power
c) cylindrical power
d) axis
e) addition
f) the magnitude and direction of any prismatic element
g) monocular centration distances
h) fitting cross heights measured in relation to the horizontal centre line
i) any additional features relating to the lens
j) frame details and measurements

A3 Spectacle Lens Identification and Refractive Index Calculation (20 minutes)

Candidates will be required to provide a written description of three lenses from a choice of six. Each description must include:

a) general type
b) material
c) form
d) horizontal and vertical lens size
e) edge finish
f) tints and/or coatings
g) any additional features

Candidates will also be required to calculate the refractive index of a single vision spectacle lens.

A4 Manual Skills Task (25 minutes)

The expected learning outcome is that the candidate should be able to demonstrate their ability to manipulate and repair spectacle frames.

In order to demonstrate these skills, candidates must carry out **two** of the following tasks:

1. Spring in lenses and set up frame.
2. Shorten a metal side by cutting and re-bending.
3. Remove a broken nylon cord, replace and refit lens.
4. Increase the angle of let-back on a plastics frame by filing.
5. Replace faulty components on a compression plug rimless mount.
6. Adjust a metal frame eyerim to accommodate high plus lenses or lenses made with a high plus front curvature.

B Spectacle Dispensing (1½ hours)

Candidates will be required to complete the following tasks:

B1 Measure and record details for a handmade, regular bridge frame fitted with single vision lenses.

B2 Measure and record details for a plastics fixed pad bridge frame fitted with bifocal lenses.

B3 Measure and record details for a frame with pads on arms fitted with progressive power lenses.

B4 Discuss the selection, fit and maintenance of special optical appliances, including those for low vision patients.

B5 Explain what advice would be given to patients on the use of new spectacles in B1 – B4.

B6 Discuss the significance of frame and lens measurements and the effects of changing them.

C Prescription Analysis (1½ Hours)

Candidates are required to discuss with three different Examiners a number of case records.

Case records may include the following topics for single vision, bifocal, trifocal and progressive power lenses as appropriate:

- Paediatric (including pre-school) dispensing
- Complex prescriptions
- Occupational dispensing
- Sports eyewear dispensing
- Gross anisometropia
- Prescribed tints
- Prescribed prisms
- Personal eye protection
- Low Vision
- Patient history
- Prescription details
- Discussion on lens types suitable for the prescription
- Fitting and adjustment details
- Advice and/or instructions given to patient

D Abnormal Ocular Conditions (½ hour)

Candidates will be required to:

D1 Identify three pathological ocular conditions from photographs or illustrations.

D2 Recognise a pathological ocular condition from a description.

D3 Explain the significance of the conditions in D1 and D2.

D4 Give full and accurate explanations of any advice and/or referral necessary for the conditions in D1 and D2.

D5 Write a referral letter including all the relevant information.

E Communication Skills (½ hour)

Candidates will be presented with a scenario to view and take notes, if required, prior to seeing the Examiner.

The candidate will be expected to show what information they have gained from the scenario and how to manage the patient in the most appropriate manner.

F Assessment of Portfolio

The candidate will be required to submit their Portfolio on the examination day for assessment by an ABDO Examiner. The assessment will be based on the 50 case records. The candidate will collect the Portfolio at the end of the day.

Notes

abdo

Examinations and Registration,
The Old Dairy, Godmersham Park,
Godmersham, Canterbury, Kent CT4 7DT
Telephone 01227 732 921
Fax 01227 733 641
Email examinations@abdo.org.uk
Website www.abdo.org.uk

July 2008