

Examination Report

September 2013 Diploma Examination



Summary and recommendations	page 2
MCQ paper	
Content	page 3
Statistics	page 3
Distribution of scores	page 3
Standard setting	page 4
Summary	page 5
CRQ paper	
Content	page 5
Statistics	page 6
Distribution of scores	page 6
Standard setting	page 8
Overall written results	page 9
The Structured Vivas	
Content	page 10
Statistics	page 10
Distribution of scores	page 11
Standard setting	page 12
The OSCE	
Content	page 12
Statistics	page 12
Distribution of scores	page 13
Standard setting	page 14
Overall oral results	page 14
The Examination Overall	
Final results	page 15

Summary

This was the third sitting of the current format for the Diploma examination. Only 7/21 of the candidates sat the written papers with the remainder having been granted exemption. Although the numbers are too small to draw firm statistical conclusions, the results suggest that these two groups of candidates perform differently in the oral part of the examination.

The small number of candidates limits interpretation of the statistical analysis of the written papers. The MCQ paper was reliable and the quality of the questions high. The pass rate was 57% with a stable pass mark of 50%. The pass rate for the CRQ paper was very low at 29%. Neither of the candidates who passed the CRQ paper went on to pass the examination overall. One question was removed after an error in the diagram supplied was identified. Only 3/7 candidates passed the written component, and only one of these went on to pass the examination overall.

The Structured Viva and OSCE parts of the examination were both reliable. There was a wide variation in the performance of candidates. 17 (81%) candidates passed the Viva. However the pass rate for those who sat the written papers was only 4/7 (57%) compared to 13/14 (93%) for those who were exempt. Average marks for each group were 62% and 78% respectively. Similar differences were observed in the OSCE. The OSCE pass rate for candidates who sat the written papers was only 3/7 (43%) compared to 13/14 (93%) for those who were exempt. The difference in average marks was even more obvious at 52% and 78%.

The pass rate for the examination was 67%, which is broadly similar to the previous two sittings.

Michael Nelson BSc (Hons) FRCOphth MAEd
Education Adviser

October 2013

The written part of the DRCOphth examination took place on 16 September 2013 at the University of Hull. Seven candidates sat the written papers, three of whom fulfilled the criteria required to pass the written component overall.

MCQ paper

Table 1 Content

Topic	Number	%
Anatomy	24	20
Physiology	24	20
Pathology	24	20
Pharmacology	18	15
Optics	24	20
Miscellaneous	6	5

MCQ paper statistics

Mean score:	64/120	(53%)
Median score:	68/120	(57%)
Standard deviation:	12.2	(10.2%)
Candidates:	7	
KR20: (measurement of reliability)	0.8	
Standard error of measurement (SEM):	5	
Range of marks:	49-81	(41%-68%)
Pass mark derived from Standard Setting:	60	(50%)
Pass rate	4/7	(57%)

Table 2 Distribution of results

Range of scores	Distribution	Number
41-50	/	1
51-60	//	2
61-70	//	2
71-80	/	1
81-90	/	1
Total		7

Standard setting

The pass mark for the paper was agreed using the Ebel method.

The examiners agreed the distribution of the questions in each category:

Table 3

	Difficult	Moderate	Easy	Total
Essential	12	16	29	49
Important	5	27	23	55
Supplementary	4	8	4	16
Total	13	51	56	120

The Diploma Sub-Committee considered the success of a minimally competent candidate in each category as below:

Table 4

	Difficult	Moderate	Easy
Essential	0.5	0.55	0.65
Important	0.4	0.45	0.5
Supplementary	0.25	0.3	0.3

Table 5 **Weighted marks**

	Difficult	Moderate	Easy	Total
Essential	2	8.8	18.85	29.65
Important	2	12.15	11.5	25.65
Supplementary	1	2.4	1.2	4.6
Total	5	23.35	31.55	59.9

The final pass mark = 60 (50%)

Summary of pass marks and pass rates for the MCQ papers to date

Table 6

	September 2011	September 2012	September 2013
Candidates	7	6	7
Mean score	64/119 (54%)	74/119 (62%)	64/120 (53%)
Median score	61/119 (51%)	75/119 (63%)	68/120 (57%)
Reliability (KR 20)	0.6	0.9	0.8
SEM	5	5	5
Standard setting	Ebel	Ebel	Ebel
Pass mark	58 (49%)	58 (49%)	60 (50%)
33% discrimination			
Negative	21	15	21
Poor	51	47	34
Good	47	58	65
Facility			
Difficult (<25%)	10	13	18
Moderate	36	56	76
Easy (>75%)	23	51	26
Pass rate	86%	89%	57%

The CRQ paper

The examination covered the following areas:

Table 7

Question	Subject	Topic	Sub-sections	Data provided
1	Pathology	Corneal infection	4	2 images (clinical photograph and culture plate)
2	Pathology	Lid lesion	3	Clinical photograph
3	Anatomy	Circle of Willis	3	Diagram
4	Investigations	Fluorescein angiogram	6	Angiogram images
5	Patient management	Retinal vein occlusion	5	2 images (retinal photograph and OCT)
6*	Investigations	Visual field	4	Humphrey field
7	Investigations	Trauma	4	2 images (clinical photograph and CT scan)
8	Optics	Lenses	4	None
9	Optics	Lenses	3	None
10	Optics	Gonioscopy lens	3	2 photographs
11	Optics	Refraction	4	None
12	Optics	Applanation tonometry	4	Photograph of prisms

* This question was removed from the paper after marking

Statistics

Mean score:	59/110	(54%)
Median score:	54/110	(49%)
Standard deviation:	13.8	(12.5%)
Range of scores:	40 to 80	(37% to 73%)
Reliability: Cronbach alpha	0.9	
Standard error of measurement:	5	
Pass mark derived from Standard Setting:	62/110	(56%)
Pass rate	2/7	(29%)

Two examiners mark each question. The mark awarded to a candidate for each question is the average awarded by the two examiners.

Table 8 Correlation between examiners marks:

1	2	3	4	5	6	7	8	9	10	11	12
0.76	0.87	0.97	0.77	0.90		0.41	0.97	0.77	0.94	0.94	0.83

Table 9 Correlation between examiners global judgments:

1	2	3	4	5	6	7	8	9	10	11	12
0.67	0.80	1	0.55	0.64		1	0.88	1	0.91	0.72	0.77

Table 10 Distribution of scores

Range of marks	Distribution	Number
31-40	/	1
41-50		
51-60	///	4
61-70		0
71-80	//	2
81-90		0
Total		7

One candidate's performance was extremely poor.

Candidate performance was variable for each question, with mean, median, modal, minimum and maximum scores (with standard deviations) of:

Table 11

Q	Subject	Mean	Median	SD	Min	Max
1	Corneal infection	6.3	6.5	2.2	3.5	9
2	Lid lesion	3.8	3.5	1.3	2	6
3	Circle of Willis	6.7	7.5	3.4	2	10
4	Fluorescein angiogram	6.6	6.5	1.7	4	9
5	Retinal vein occlusion	6.4	7.5	2.9	1	10
6	Visual field*					
7	Trauma	8.1	8	0.6	7.5	9
8	Lenses	2.9	1.5	3.0	0	8
9	Lenses	1.4	1	2.1	0	6
10	Gonioscopy lens	4.6	4.5	3.0	1	9
11	Refraction	6.2	6	2.3	4	10
12	Applanation tonometry	5.7	6	2.0	2.5	8

*Question 6 was withdrawn from the examination paper

Candidates generally performed badly with the optics questions (8 and 9)

Summary of statistics

Table 12

	2011	2012	2013
Mean score	68/120 (57%)	80/120 (67%)	59/110 (54%)
Median score	74/120 (62%)	82.5/120 (69%)	54/110 (49%)
Standard deviation	18 (15%)	12.6 (11%)	13.8 (12.5%)
Reliability	0.9	0.9	0.9
SEM	5	7	5
Pass mark	66/120 (55%)	75/120 (63%)	62/110 (56%)
Pass rate	6/7 (86%)	5/6 (83%)	2/7 (29%)
Correlation with MCQ	0.45	0.83	0.73

Standard setting

The borderline candidate method was used to identify the pass mark for the CRQ. The examiners who marked the CRQ paper were asked to allocate a mark according to the marking scheme provided and, in addition, class the candidate's performance as a pass, fail or borderline. The sum of each median borderline mark was used to produce the pass mark:

Table 13

	Topic	Examiners A				Examiners B			
		No. Fail	No. Border	No. Pass	Median Border	No. Fail	No. Border	No. Pass	Median Border
1	Anatomy	2	2	3	6.5	1	3	3	5
2	Pathology	4	2	1	4.5	5	2	0	5
3	Pathology	2	1	4	6	2	1	4	6
4	Investigations	0	6	1	5.5	1	4	2	6.5
5	Investigations	3	1	3	7	1	1	5	6
6*	Investigations								
7	Patient management	0	0	7	8.5	0	1	6	7
8	Investigations	4	2	1	5	5	1	1	5
9	Optics	6	0	1	4.5	6	1	0	5
10	Optics	2	3	2	5	3	2	2	4.5
11	Optics	2	2	3	5.5	2	1	4	5
12	Optics	1	4	2	5	2	2	3	6

Pass mark = 62/110 (56%)

Overall Results for the written papers

Candidates are allowed a degree of cross compensation between the MCQ and CRQ papers but are required to:

1. *Obtain a combined mark from both papers that equals or exceeds the combined pass marks obtained by the standard setting exercise explained above.*
2. *Obtain a mark in both papers that equals or exceeds the pass mark minus 1 standard error of measurement for each paper.*

A candidate is therefore allowed to compensate for a marginal fail in one paper by a very good performance in the other paper. They cannot compensate for an extremely poor performance in one paper whatever the combined mark.

The pass marks for both papers are combined to produce a combined pass mark for the written part of the examination of 122/230.

Candidates are expected to obtain at least the pass mark minus 1 SEM in each paper. The minimum mark required in each paper was 55/120 in the MCQ paper and 57/110 in the CRQ paper.

Three candidates gained marks that met both standards above and therefore passed the written component overall.

Table 14 **Distribution of scores**

Range of marks	Distribution	Number
91-100	/	1
101-110	//	2
111-120		0
121-130	//	2
131-140		0
141-150		0
151-160	//	2
Total		

Mean	123/230	(54%)
Median	121/230	(53%)
Minimum	93/230	(40%)
Maximum	156/230	(68%)

The oral parts of the DRCOphth examination were held on 17 and 18 September 2013.

Candidates

21 candidates sat the clinical examination. 14 candidates had gained exemption from the written papers having passed the Part 1 FRCOphth, Part 2 MRCOphth or Part 2 MRCSEd examinations.

The Structured Vivas

There were five structured vivas, which were held on 17 September at the University of Hull. The communication skills OSCE station was conducted as one of the viva stations, making six stations in all. Each viva lasted 5 minutes. The stations were:

Station 1. Patient investigations and data interpretation
Round 1: Sudden Loss of Vision
Round 2: Uveitis

Station 2. Patient management 1
Round 1: Blepharitis
Round 2: Football Eye

Station 3. Patient management 2
Round 1: Hess Chart
Round 2: Vernal disease

Station 4. Ethics and evidence based medicine
Round 1: Laser consent
Round 2: Consent in Dementia

Station 5. Public Health
Round 1: Conjunctivitis
Round 2: Endophthalmitis

The examination was conducted in four rounds. Each station began with a clinical scenario, and subsequent discussion was based upon, but not limited to, the clinical diagnosis suggested by the scenario.

Results:

Maximum mark (5 stations, 10 examiners, 6 marks per station): 60

Pass mark (using borderline candidate method):	32	(53%)
Mean score:	44	(73%)
Median score:	44	(73%)
Range:	23-57	(38%-95%)
Standard deviation	10.2	(17%)
Reliability: (Cronbach alpha)	0.9	
SEM:	3	
Final adjusted pass mark (+ 1 SEM)	35	(58%)
Pass rate	17/21	(81%)

Table 15 Distribution of results

Range of scores	Distribution	Number
21-25	/	1
26-30	///	3
31-36		0
36-40	///	3
41-45	////	5
46-50	/	1
51-55	//////	7
56-60	/	1
Total		21

Table 16 Results for each station

Station		Mean score	Median score	Range
1	Patient Investigations	7.8	8	0-12
2	Patient Management 1	9.6	10	5-12
3	Patient Management 2	9.7	10	3-12
4	Ethics and EBM	7.5	8	3-12
5	Public Health	9.1	9	6-12

Table 17 Correlation between examiner's marks at each station:

Station 1	Station 2	Station 3	Station 4	Station 5
PI	PM1	PM2	AER/EBM	Public health
0.92	0.76	0.94	0.67	0.51

Table 18 Correlation between examiner's global judgements at each station:

Station 1	Station 2	Station 3	Station 4	Station 5
PI	PM1	PM2	AER/EBM	Public health
0.86	0.80	0.80	0.78	N/A*

*Examiner A awarded pass grades to 20 candidates which made it impossible to provide a meaningful correlation with Examiner B

Table 19 Correlation between viva stations:

		Station 2	Station 3	Station 4	Station 5
		PM1	PM2	AER/EBM	Public health
Station 1	PI	0.51	0.64	0.68	0.59
Station 2	PM1		0.44	0.68	0.59
Station 3	PM2			0.63	0.53
Station 4	AER/EBM				0.59

Table 20 Standard setting for the structured vivas:

	1		2		3		4		5		Total
<i>Number of borderline candidates</i>	6	7	4	1	3	6	4	6	1	5	
<i>Median borderline candidate mark</i>	4.5	3	3.5	3	3	3.5	3	3	3	3	32

The pass mark for the structured viva was increased by 1 SEM to 35/60 (58%)

The OSCE

There were seven OSCE stations in all. The six clinical stations were held on 18 September at the Hull and East Yorkshire Eye Hospital. The communication OSCE was conducted with the vivas. There were four rotations. Stations 1-6 last for 10 minutes, Station 7 lasts for 5 minutes.

Station 1: Posterior Segment 1

Station 2: Anterior Segment

Station 3: Strabismus and Neuro-Ophthalmology

Station 4: Posterior Segment 2

Station 5: Pupils and Visual Fields

Station 6: External Eye

Station 7: Communication Skills (takes place logistically with Structured Viva)

Patients with appropriate conditions were available for the examination.

Results

Candidates examine two patients in stations 1-6 and each patient is worth a maximum of 12 marks (2 examiners x 3 marks x 2 criteria). One patient is examined in station 7 (communication skills) and is worth a maximum of 18 points. The maximum mark for the OSCE 162.

Pass mark (using borderline candidate method):	83.5/162
Mean score:	108
Median score:	113
Range:	28-151
Reliability (Cronbach alpha):	0.96
SEM:	7
Adjusted pass mark (+1 SEM)	90/162 (56%)
Pass rate	16/21 (76%)

Table 21 Distribution of results

Range of scores	Distribution	Number (candidates sat written paper)
21-30	/	1 (1)
31-40		
41-50	/	1 (1)
51-60	/	1 (1)
61-70		
71-80		
81-90	//	2 (1)
91-100	/	1
101-110	////	4 (1)
111-120	//	2 (1)
121-130	////	4
131-140	//	2 (1)
141-150	//	2
151-160	/	1
Total		21

Table 22 Station marks

Station		Maximum possible	Mean	Median	Min	Max
1	Posterior segment 1	24	13.6	15	2	24
2	Anterior segment	24	15.4	16	3	24
3	Strabismus and Neuro-ophthalmology	24	17.5	20	0	24
4	Posterior segment 2	24	16.5	17	7	24
5	Pupils and visual fields	24	15.8	16	0	24
6	External eye	24	18.2	20	3	24
7	Communication	18	11.0	12	1	18

Table 23 Correlation between examiner's marks at each station

<i>Station 1</i>	<i>Station 2</i>	<i>Station 3</i>	<i>Station 4</i>	<i>Station 5</i>	<i>Station 6</i>	<i>Station 7</i>
<i>Posterior segment</i>	<i>Anterior segment</i>	<i>Strabismus neuro</i>	<i>Posterior segment</i>	<i>Pupils fields</i>	<i>External</i>	<i>Comms</i>
0.88	0.91	0.79	0.79	0.96	0.89	0.93

Table 24 Correlation between examiner's global judgements at each station

<i>Station 1</i>	<i>Station 2</i>	<i>Station 3</i>	<i>Station 4</i>	<i>Station 5</i>	<i>Station 6</i>	<i>Station 7</i>
<i>Posterior segment</i>	<i>Anterior segment</i>	<i>Strabismus neuro</i>	<i>Posterior segment</i>	<i>Pupils fields</i>	<i>External</i>	<i>Comms</i>
0.80	0.81	0.77	0.86	0.96	0.90	0.96

Table 25 Correlation between station scores (combined marks 2 examiners)

		Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
		<i>Anterior segment</i>	<i>Strabismus neuro</i>	<i>Posterior segment</i>	<i>Pupils fields</i>	<i>External</i>	<i>Comms</i>
Station 1	<i>Posterior segment</i>	0.65	0.71	0.82	0.74	0.70	0.57
Station 2	<i>Anterior segment</i>		0.77	0.46	0.78	0.66	0.63
Station 3	<i>Strabismus neuro</i>			0.58	0.79	0.62	0.88
Station 4	<i>Posterior segment</i>				0.44	0.44	0.46
Station 5	<i>Pupils fields</i>					0.70	0.75
Station 6	<i>External</i>						0.39

Table 26 Standard setting for the OSCE

Station	1		2		3		4		5		6		7		Total
No. of borderline candidates	4	2	1	3	1	4	1	0	2	1	0	1	3	2	
Median borderline candidate score	6.5	7	6.5	6	6	5.5	8	8	4	6	6	7	3	4	83.5

The pass mark for the OSCE was increased by 1 SEM from 83.5/162 to 90/162.

Overall results for the oral examination

Pass mark	125/222	(56%)
Mean	151.8	(68%)
Median	159	(72%)
Range	56-206	(25%-93%)

To pass the oral examination candidates must achieve 125/222 overall, 32/60 in the viva and 90/162 in the OSCE)

Pass rate for the oral examination	16/21	(76%)
Pass rate for the entire examination	14/21	(67%)

Table 27 **Distribution of scores**

Score	Distribution	Total (candidates who sat written paper)
51-60	//	2 (2)
61-70		
71-80		
81-90	/	1 (1)
91-100		
101-110		
111-120	/	1
121-130		
131-140	//	2 (1)
141-150	///	3 (1)
151-160	//	2 (1)
161-170	///	3
171-180		
181-190	///	3
191-200	///	3 (1)
201-210	/	1
Total		21

Final results

To be awarded the Diploma of the Royal College of Ophthalmologists (DRCOphth) candidates are expected to:

1. Pass the written component as outlined above
2. Achieve a mark in the viva that equals or exceeds the pass mark plus 1 SEM
3. Achieve a mark in the OSCE that equals or exceeds the pass mark plus 1 SEM.

A degree of cross-compensation is allowed between the written parts of the examination as outlined above. Candidates can cross compensate for a marginal fail in the Structured Viva with an exceptional performance in the OSCE. The OSCE must be passed outright.

14 candidates met all four standards and passed the examination (13 were exempted from the written papers having passed the Part 1 FRCOphth examination, or equivalent). Two candidates passed the oral examination but failed both of the written papers. Of the three candidates who passed the written examination, only one passed the oral examination.

Table 28 **Correlation between scores in each part of examination:**

	CRQ*	VIVA	OSCE
MCQ*	0.73	0.10	0.08
CRQ*		0.73	0.73
VIVA			0.89

(*Correlation between written and oral papers based upon the results from only 7 candidates)

Correlation between written and oral examinations = 0.46

Table 29 Summary of examination statistics

Date	2011	2012	2013
Candidates	20 (7 written)	18 (6 written)	21 (7 written)
MCQ pass mark	58	58	60
Reliability	0.6	0.9	0.8
CRQ pass mark	66/120	75/120	62/110
Reliability	0.9	0.9	0.9
Viva pass mark	36	36	35
Reliability	0.7	0.8	0.9
OSCE pass mark	89	95	90
Reliability	0.9	0.8	0.96
Written pass rate	6/7	5/6	3/7
Oral pass rate	17/20	13/18	16/21
Overall pass rate	15/20 (75%)	12/18 (67%)	14/21 (67%)