

# Examination Report

## September 2011 Diploma Examination



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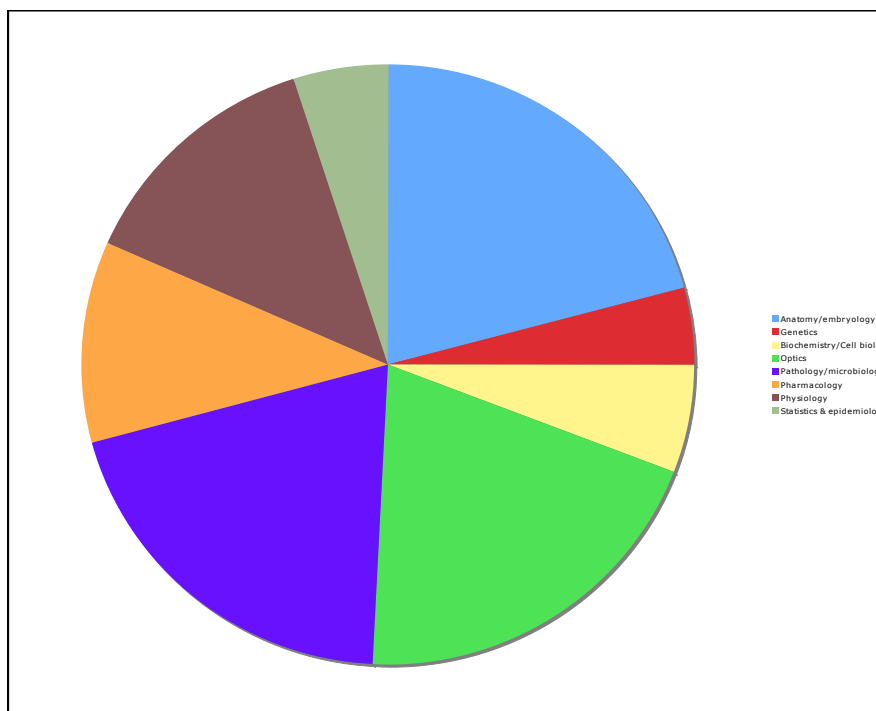
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The written part of the DRCophth examination took place on 12 September 2011 in the Centre for Health Sciences, Inverness. Seven candidates sat the written papers, of whom six fulfilled the criteria required to pass the written examination overall.

### MCQ paper

#### Content

Topic		%
Anatomy/embryology	25	21
Genetics	5	4
Biochemistry/Cell biology	7	6
Optics	24	20
Pathology/microbiology	24	20
Pharmacology	13	11
Physiology	16	13
Statistics & epidemiology	6	5
Investigations	0	0
	120	100



#### MCQ paper statistics

Mean score:		64/119
Median score:		61/119
Standard deviation:		7.5
Candidates:		7
KR20: (measurement of reliability)	0.6	
Standard error of measurement (SEM):		5
Range of marks:		52-76
Pass mark derived from Standard Setting:	58	
Pass rate		6/7 (86%)

### Distribution of results

Range of scores	Distribution	Number
1-30		0
31-40		0
41-50		0
51-60	//	2
61-70	///	3
71-80	//	2
81-90		0
91-100		0
101-120		0
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:

	Difficult	Moderate	Easy	Total
Essential	4	19	22	45
Important	5	31	18	54
Supplementary	4	13	3	20
Total	13	63	43	119

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

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

### Weighted marks

	Difficult	Moderate	Easy	Total
Essential	2	10.45	14.3	26.75
Important	2	13.95	9	24.95
Supplementary	1	3.9	0.9	5.8
Total	5	28.3	24.2	57.5

**The final pass mark = 58 (49%)**

## Comments

Interpretation of the quality of the MCQ examination must be limited as only 7 candidates stab the paper.

The reliability of the paper was only moderate, with a KR of 0.6. This is at least in part due to the wide variation in candidate's performance.

The pass rate for the MCQ examination was high. The pass mark was relatively low.

The MCQ is a moderate predictor of performance in the CRQ but has a poor correlation with the viva and zero correlation with the OSCE. There are several possible explanations for these findings. The candidates may be unfamiliar with the type of MCQ used in the examination (single best answer from 4) or were poorly prepared for the range of subjects covered by the questions.

There were a large number of negatively discriminating questions. Questions on optics, pharmacology and physiology were the best discriminators between good and poor candidates.

Questions written with positively phrased item options were much better at discrimination between candidates than those phrased in a negative style with statement options.

One question (question 2) was removed from the paper as the answer was considered to be ambiguous by the Senior Examiner.

## The CRQ paper

The examination on 12 September 2011 covered the following areas:

Question	Subject	Topic	Sub-sections	Data provided/comment
1	Anatomy	Orbit	4	Diagram of orbital apex
2	Investigations	Fluorescein angiogram	5	IFA
3	Pathology	Skin tumour	5	Image of lesion
4	Patient management	Retinal vein occlusion	4	Retinal photograph
5	Investigations	OCT	5	OCT image
6	Optics	Ray diagram	5	None
7	Investigations	Biometry	4	Biometry
8	Investigations	Visual fields	4	Visual fields
9	Investigations	Hess chart	5	Hess chart
10	Optics	IBO	3	Image of IBO
11	Investigations	Horner's syndrome	4	Clinical image
12	Optics	Refraction	4	Refraction results

## Statistics

Mean score:	68/120
Median score:	74/120
Standard deviation:	18
Range of scores:	30.5-88.5
Reliability: Cronbach alpha	0.9
Standard error of measurement:	5
Pass mark derived from Standard Setting:	66
Pass rate	6/7 (86%)

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

### Correlation between examiners marks:

1	2	3	4	5	6	7	8	9	10	11	12
0.98	0.80	0.57	0.96	0.60	0.97	0.89	0.95	0.97	0.86	0.97	0.98

### Correlation between examiners global judgments:

1	2	3	4	5	6	7	8	9	10	11	12
0.89	0.80	0.91	0.57	0.79	0.96	0.81	0.60	0.56	0.97	1.00	0.89

There was close agreement between examiners marks for all questions apart from 3 and 5. Global judgments differed between examiners for questions 4, 8 and 9.

### Distribution of scores

Range of marks	Distribution	Number
< 20		0
21-30	/	1
31-40		0
41-50		0
51-60		0
61-70	/	1
71-80	////	4
81-90	/	1
91-100		0
101-110		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:

Q	Subject	Mean	Median	Mode	SD	Min	Max
1	Orbit	6	7	8	2	3	9
2	Fluorescein angiogram	6	6	9	2	3	9
3	Skin tumour	6	6	6	2	3	8
4	Retinal vein occlusion	6	7	9	3	1	9
5	OCT	5	5	5	2	3	9
6	Ray diagram	4	3	3	2	2	8
7	Biometry	6	6	8	2	3	9
8	Visual fields	6	6	4	2	4	8
9	Hess chart	5	6	6	2	0	7
10	IBO	5	6	7	2	3	7
11	Horner's syndrome	7	8	8	2	3	10
12	Refraction	6	7	NA	3	0	9

Question 6 was answered poorly by candidates (mode = 3)

Question 8 was answered poorly by candidates (mode = 4)

Question 4 was answered very well by candidates (mode = 9)

### 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:

	Topic	No. Pass		No. Fail		No. Borderline		Median borderline mark	
		B	A	B	A	B	A	B	A
1	Orbit	4	2	3	3	0	2	6	6.5
2	Fluorescein angiogram	3	3	1	2	3	2	5	6.5
3	Skin tumour	4	2	2	1	1	4	5	5
4	Retinal vein occlusion	5	4	2	1	0	2	5.5	5.5
5	OCT	1	4	3	1	3	2	5	6
6	Ray diagram	1	1	5	5	1	1	6	5
7	Biometry	5	3	1	1	1	3	6	5
8	Visual fields	2	4	2	2	3	1	5	5
9	Hess chart	4	3	1	1	2	3	5.5	6
10	IBO	0	2	4	2	3	3	6	6
11	Horner's syndrome	6	2	1	2	0	3	4.5	5
12	Refraction	4	3	2	2	1	2	5	6.5
Hypothetical pass marks for each 'examiner'								64.5	68

Pass mark = 66/120 (55%)

One question was 'easy' or well prepared for with >50% of candidates having been judged as a pass by both examiners (Q4)

One question was 'difficult' or ill prepared for with >50% of candidates having been judged as a pass by both examiners (Q6)

### Comments

The CRQ paper was reliable with a Cronbach alpha value of 0.9. Candidate performance was very variable, with one candidate performing particularly badly. One question was answered badly by the majority of candidates: drawing a ray diagram. Two examiners marked each question.

### Overall Results for the written component

Candidates are allowed a degree of cross compensation between the MCQ and CRQ papers. A marginal fail in one written paper can be compensated by an exceptional performance in the oral part of the examination.

The pass marks for both papers are combined to produce a combined pass mark for the written part of the examination: 124/239 (51%)

Candidates are expected to obtain at least the pass mark minus 1 SEM in each paper. The minimum mark required in each paper was 53 (44%) in the MCQ paper and 61 (51%) in the CRQ paper.

Five candidates gained marks that met both standards above and therefore passed the examination overall.

### Distribution of scores

Range of marks	Distribution	Number
81-90		0
91-100	/	1
101-110		0
111-120	/	1
121-130		0
131-140	///	3
141-150		0
151-160	//	2
161-170		0
Total		7

Mean 132 (55%)

Median 135 (56%)

Minimum 90.5 (38%)

Maximum 159.5 (67%)

The oral parts of the DRCOphth examination were held on 13 and 14 September 2011.

### **Candidates**

20 candidates sat the clinical examination. 13 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 13 September in the Centre for Health Sciences in Inverness. The communication skills OSCE station was conducted as one of the viva stations, making six stations in all. Each viva lasted 10 minutes. The stations were:

**Station 1.** Patient investigations and data interpretation  
Round 1: Amsler chart  
Round 2: Ultrasound

**Station 2.** Patient management 1  
Round 1: Endophthalmitis  
Round 2: Uveitis

**Station 3.** Patient management 2  
Round 1: Temporal artery biopsy  
Round 2: Diabetic retinopathy

**Station 4.** Ethics and evidence based medicine  
Round 1: Consent  
Round 2: AMD

**Station 5.** Health promotion  
Round 1: Adenovirus conjunctivitis  
Round 2: Amblyopia

The examination was conducted in four rounds.

### **Results:**

Maximum mark (5 stations, 10 examiners, 6 marks per station):	60
Pass mark (using borderline candidate method):	33
Mean score:	44.4
Median score:	45.5
Range:	18-27
Reliability: (Cronbach alpha)	0.7
SEM:	3
Adjusted pass mark (+ 1 SEM)	36

To pass the vivas candidates are required to obtain a mark that equals or exceeds the pass mark identified by the standards setting plus 1 SEM (36/60).



## Distribution of results

Range of scores	Distribution	Number
0-10		0
11-20	/	1
21-30		0
31-40	///	4
41-50	//// ////	9
51-60	//// /	6
		20

Correlation between examiner's **marks** at each station:

Station 1	Station 2	Station 3	Station 4	Station 5
PM1	PM2	PI	AER/EBM	HPDP
0.77	0.86	0.99	0.85	0.77

Correlation between examiner's **global judgements** at each station:

Station 1	Station 2	Station 3	Station 4	Station 5
PI	PM	PM	AER	HPDP
0.70	0.92	0.91	0.96	0.9

The correlation between examiners marks and global judgements at each station was acceptable.

### Correlation between viva stations:

		Station 2	Station 3	Station 4	Station 5
		PM	PI	AER/EBM	HPDP
Station 1	PM	0.60	0.70	0.32	0.31
Station 2	PM		0.78	0.47	0.29
Station 3	PI			0.29	0.32
Station 4	AER/EBM				0.45

The correlation between the viva stations was moderate to very good. The weakest correlation was between the HPDP and EBM/AER stations and the PM and PI stations.

### Standard setting for the structured vivas:

	1		2		3		4		5		Total
Number of borderline candidates	2	7	5	3	2	3	4	3	3	5	
Median borderline candidate mark	3.5	3	4	3	4	4	3	3	3	2	32.5

The pass mark for the structured viva was increased by 1 SEM to 36/60 (60%)

## Comments

The reliability of the examination was moderate. One candidate's performance was extremely poor. Candidates generally found station 4 (ARE/EBM consent and AMD) the most challenging (modal mark = 6)

## The OSCE

There were seven OSCE stations in all. The six clinical stations were held on 14 September in the Department of Ophthalmology at Raigmore Hospital, Inverness. The communication OSCE was conducted with the vivas. There were four rotations. Stations 1-6 last 10 minutes, Station 7 lasts 5 minutes.

Station 1: Posterior Segment 1

Station 2: Posterior Segment 2

Station 3: Anterior Segment

Station 4: Strabismus and Neuro-Ophthalmology

Station 5: Pupils and Visual Fields

Station 6: External Eye

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

## 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. To balance the contribution to a candidate's mark from each patient, the mark from station 7 is scaled by 2/3. The maximum mark for the OSCE, after weighting, is hence 156.

Pass mark (using borderline candidate method):	81/156
Mean score:	104
Median score:	110
Range:	24-143
Reliability (Cronbach alpha):	0.9
SEM:	8
Adjusted pass mark (+1 SEM)	89/156 (57%)

## Distribution of results

Range of scores	Distribution	Number
21-30	/	1
31-40		0
41-50		0
51-60		0
61-70	/	1
71-80	/	1
81-90	///	3
91-100	/	1
101-110	///	3
111-120	//////	6
121-130	/	1
131-140	/	1
141-150	//	2
Total		20

### Correlation between examiner's **marks** at each station

Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Posterior segment	Posterior segment	Anterior segment	Strabismus neuro	Pupils fields	External	Comms
0.926	0.843	0.881	0.906	0.942	0.848	0.792

### Correlation between examiner's global **judgements** at each station

Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
Posterior segment	Posterior segment	Anterior segment	Strabismus neuro	Pupils fields	External	Comms
0.862	0.967	0.773	0.858	0.957	0.870	0.856

There was close agreement between examiners marks and global judgments.

### Correlation between station scores (combined marks 2 examiners)

		Station 2	Station 3	Station 4	Station 5	Station 6	Station 7
		Posterior segment	Anterior segment	Strabismus neuro	Pupils fields	External	Comms
Station 1	Posterior segment	0.231	0.224	0.526	0.645	0.613	0.074
Station 2	Posterior segment		0.643	0.671	0.185	0.408	0.555
Station 3	Anterior segment			0.590	0.247	0.136	0.442
Station 4	Strabismus neuro				0.430	0.569	0.512
Station 5	Pupils fields					0.600	0.126
Station 6	External						0.297

Best correlation between:

- Posterior segment and strabismus, pupils/fields and external stations

Poor or negative correlation between:

- Communication and posterior segment and pupils/fields stations.

### Standard setting for the OSCE

Station	1		2		3		4		5		6		7	
No. of borderline candidates	6	4	3	4	4	4	4	3	4	5	6	4	6	4
Median borderline candidate score	6.5	6	5	6.5	6	8.5	6	6	5.5	6	6.5	5	3	4

The pass mark for the OSCE was increased by 1 SEM from 81/156 to 89/156.

### Comments

The OSCE was very reliable and candidate performance was generally very good. Candidates were least prepared for the communication skills station.

### Final results

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

1. Achieve a total mark from all 4 parts of the examination (MCQ, CRQ, viva and OSCE) that equals or exceeds the sum of the pass marks for each examination, AND
2. Achieve a mark in each of the written parts of the examination that equals or exceeds the pass mark minus 1 SEM, AND
3. Achieve a mark in the viva that equals or exceeds the pass mark agreed by the BCM standard setting
4. Achieve a mark in the OSCE that equals or exceeds the pass mark plus 1 SEM.

A degree of cross-compensation is therefore allowed between the 4 parts of the examination, with the exception of the OSCE, which must be passed outright.

One candidate failed to meet standard 2 above, but performed so well in the oral part of the examination that the senior examiner considered that they should be awarded a pass.

### Correlation between scores in each part of examination:

	CRQ	VIVA	OSCE
MCQ	0.461	0.304	-0.015
CRQ		0.820	0.842
VIVA			0.829

Correlation between written and oral examinations = 0.708

## Breakdown of Clinical Examination

### Breakdown of clinical examination results by training

	Failed	Passed	Total
In OST	0	4	4
Not in OST	5	11	16
Total	5	15	20

### Breakdown of clinical examination results by gender

	Failed	Passed	Total
Female	1	7	8
Male	4	8	12
Total	5	15	20

### Breakdown of clinical examination results by country of qualification

	Failed	Passed	Total
UK	0	4	4
Outside UK (Inc Republic of Ireland)	5	11	16
Total	5	15	20

### Breakdown of clinical examination results by stated ethnicity

	Failed	Passed	Total
White	0	6	6
Not White	4	6	10
Unknown	1	3	4
Total	5	15	20

## **Summary**

The first of the new style of DRCOphth examination has been successful, with a credible pass rate and a high reliability of three of the assessment components. One candidate was very poorly prepared and only passed the MCQ.

The MCQ paper was only poorly reliable, but the statistics produced for an examination with only 7 candidates must be interpreted with caution.

Of the 7 candidates who sat the written papers, 5 passed overall. Of the 13 who were exempted from the written papers, 10 passed.

Correlation between examiners marks and judgments was generally very high, which suggests that they were well prepared and the marking schemes were valid.

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