

Examination Report



January 2015 Part 1 FRCOphth Examination

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Summary

The twenty-sixth Part 1 FRCOphth examination took place on 12th January 2015. Eighty-nine candidates sat the examination, of whom 50 (56%) fulfilled the criteria required to pass the examination overall. The pass rate is the highest since October 2012.

Both parts of the examination had a high reliability (>0.90) and had an acceptable correlation (0.77).

The pass rate in the MCQ paper is similar to the last sitting at 60%. The quality of the MCQ paper dipped a little from the last paper, (which had the best statistics for item discrimination) with 46% of the questions good discriminators.

The pass rate in the CRQ paper was higher than at the last 5 sittings (56%). An initial review of the variance in marking between examiners prompted the remarking of an entire question (question 11) by the senior examiner.

There were no statistically significant differences in the success rates of candidates based upon their gender, training, country of qualification, or first language, although data was incomplete for many of these characteristics.

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Quality of questions

The Speedwell data allows us to identify easy, moderate and difficult questions, and those, which are good, poor or perverse (negative) discriminators. Ideally all questions should be moderate and good.

(Table 3)

	Negative		Poor		Good		Total	%
	< 0		0- 0.249		>0.250			
	Number	%	Number	%	Number	%		
Difficult Facility<25%	4	3	5	4	0	0	9	8
Moderate Facility 25- 75%	5	4	38	32	48	40	91	76
Easy Facility >75%	0	0	13	11	7	6	20	17
Total	9	8	56	47	55	46	120	100

Standard setting

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

(Table 4)

	Difficult	Moderate	Easy	Total
Essential	1	32	26	59
Important	2	18	27	47
Supplementary	0	11	3	14
Total	3	61	56	120

The Part 1 FRCOphth Sub-Committee considered the success of a minimally competent candidate in each category as below:

(Table 5)

	Difficult	Moderate	Easy	
Essential	0.55	0.65	0.75	
Important	0.45	0.5	0.55	
Supplementary	0.25	0.25	0.25	

(Table 6)

	Difficult	Moderate	Easy	Total
Essential	0.55	20.8	19.5	40.85
Important	0.9	9	14.85	24.75
Supplementary	0	2.75	0.75	3.5
TOTAL	1.45	32.55	35.1	69.1

The MCQ pass mark = 69 (58%)

Comparison of pass marks and rates for last 7 MCQ papers (table 7)

	Jan 13	May 13	Oct 13	Jan 14	May 14	Oct 14	Jan 15
Candidates	91	102	151	77	119	232	89
Mean score	67	69	72	73	67	72	69
Reliability (KR 20)	0.87	0.88	0.9	0.9	0.9	0.9	0.86
SEM	4.9	4.9	4	4.7	4.8	4.8	4.9
Standard setting	Ebel	Ebel	Ebel	Ebel	Ebel	Ebel	Ebel
Pass mark	67 (56%)	69 (58%)	70 (58%)	68 (57%)	69 (58%)	69 (58%)	69 (58%)
33% discrimination							
Negative	7	5	3	10	4	5	9
Poor (0-0.249)	47	48	48	59	43	40	56
Good (>0.250)	65	67	69	51	72	75	55
Facility							
Difficult (<25%)	8	5	2	12	6	3	9
Moderate	87	85	92	70	82	94	91
Easy (>75%)	24	30	26	38	31	23	20
Questions	119	120	120	120	119	120	120
Pass number (rate)	46 (51%)	51 (50%)	88 (58%)	55 (71%)	54 (45%)	144 (62%)	53 (60%)

The CRQ paper

(Table 8)

Question	Subject	Topic	Sub-sections	Data provided
1	Anatomy	Circle of Willis	3	Diagram to label
2	Pathology	Endophthalmitis	5	Image of enucleated eye
3	Pathology	Temporal arteritis	5	Photomicrograph
4	Optics*	Galilean telescope	4	None
5	Optics*	Chromatic aberration	6	Duochrome test
6	Optics	AC/A ratio	5	None
7	Optics	Lenses	7	66D and 78D lenses
8	Investigations	OCT	6	OCT image
9	Investigations	Biometry	6	Biometry print out
10	Investigations	Hess chart	6	Hess chart
11	Investigations	Corneal topography	6	Topography image
12	Genetics*	Retinitis pigmentosa	5	None

* Candidates are expected to draw a diagram as part of the answer

Statistics

Mean score	70/120	58%
Median score	74/120	62%
Standard deviation	16.4	13.7
Candidates	89	
Reliability: Cronbach alpha	0.92	
Standard error of measurement (SEM):	4.6	3.8%
Range of marks	19 - 95	16% - 79%
Pass mark derived from Standard Setting	73/120	61%
Pass mark – 1 SEM	68/120	57%
Pass rate	50/89	56%

Distribution of scores (Table 9)

Range of marks	Distribution	Number
0-30	///	3
31-40	///	3
41-50	////	4
51-60	///// ///// /	11
61-70	//// / ///// ///// /	16
71-80	///// ///// ///// ///// /	24
81-90	///// ///// ///// ///// /	22
91-100	///// /	6
101-120		0
Total		89

Two examiners marked each question in the CRQ papers and the average mark from each was used to produce the candidate mark. Each question has maximum possible 10 marks. Candidate performance was variable for each question, with mean, median, minimum and maximum scores (with standard deviations) of:

(Table 10) Results for each question

Q	Subject	Mean	Median	Min	Max	SD
1	Anatomy	7.7	8.5	0	10	2.5
2	Pathology	5.3	5.5	2	9	1.7
3	Pathology	6.2	6	1	10	1.8
4	Optics	4.7	5	0	10	3.3
5	Optics	7.6	8.5	0	10	2.4
6	Optics	2.7	2.5	0	8	2.0
7	Optics	7.2	7.5	2	10	1.9
8	Investigations	5.8	6.5	1	10	2.2
9	Investigations	5.6	5.5	0.5	10	2.0
10	Investigations	5.4	5.5	0	10	2.7
11	Investigations	6.7	7	2	9.5	1.6
12	Genetics	5.8	6	0	10	2.2
	Total	70.6	74.5	20	96	16.4

Candidates performed badly in or were particularly ill prepared for questions 4 and 6 (Optics)

33% Item discrimination (ID) and facility (F) for each question and examiner:

(Table 11) Item discrimination and facility for each question and examiner

Q	Subject	33% ID Examiner A	F examiner A	33% ID examiner B	F examiner B
1	Anatomy	273	85	364	76
2	Pathology	364	71	394	43
3	Pathology	455	67	273	74
4	Optics	545	48	545	36
5	Optics	455	81	455	80
6	Optics	273	20	242	20
7	Optics	273	72	333	73
8	Investigations	424	62	394	62
9	Investigations	333	35	424	61
10	Investigations	606	40	636	52
11	Investigations	364	81	485	55
12	Genetics	394	73	485	42

Question 10 (investigations) was better able to discriminate between the poor and good candidates based upon their performance in the CRQ overall. Questions 1 (anatomy), and 6 & 7 (optics) were relatively poor at discriminating between the poor and good candidates.

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 12) Standard setting by each examiner

	Topic	Examiners A				Examiners B			
		No. Fail	No. Border	No. Pass	Median Border	No. Fail	No. Border	No. Pass	Median Border
1	Anatomy	13	8	68	6	15	14	60	7
2	Pathology	15	30	44	5	44	33	12	6
3	Pathology	17	28	44	6	12	31	46	6
4	Optics	40	12	37	5.5	55	11	23	7
5	Optics	16	4	69	5.5	17	17	55	7
6	Optics	75	8	6	5	74	11	4	5
7	Optics	23	21	45	7	17	36	36	7
8	Investigations	29	29	31	6	33	30	26	6
9	Investigations	43	32	14	6.5	24	36	29	6
10	Investigations	48	22	19	7	29	26	34	5.5
11	Investigations	12	18	59	6	26	32	31	7
12	Genetics	23	28	38	5	49	20	20	7
Total		354	240	474	70.5	395	297	376	76.5

(Table 13) Comparison between examiners

Q	Subject	Mean mark examiner A	Mean mark examiner B	Mean absolute difference	t test of difference	Correlation between marks	Correlation between global judgements
1	Anatomy	7.8	7.6	0.2	0.070	0.97	0.87
2	Pathology	5.4	5.1	0.7	0.001	0.84	0.61
3	Pathology	6.0	6.3	0.4	0.002	0.91	0.79
4	Optics	4.9	4.6	0.8	0.009	0.95	0.74
5	Optics	7.4	7.7	0.9	0.019	0.89	0.68
6	Optics	2.8	2.7	0.6	0.451	0.89	0.51
7	Optics	7.2	7.1	0.4	0.124	0.94	0.80
8	Investigations	5.9	5.7	0.4	0.066	0.94	0.81
9	Investigations	5.4	5.9	0.8	0.000	0.90	0.63
10	Investigations	5.4	5.4	0.7	0.559	0.92	0.69
11	Investigations	7.1	6.3	0.9	0.000	0.87	0.69
12	Genetics	5.7	5.8	0.8	0.348	0.90	0.63

(Table 14) Examiner concordance

Q	Scripts remarked	Examiner B - A								Pairings (A/B)
		-4	-3	-2	+/- 1 or 0	+2	+3	+4	+5	
1				1	83	4	1			
2				1	79	6	3			
3			2	4	83					
4			1	4	75	5	4			
5			3	8	73	4	1			
6				4	77	7	1			
7				1	83	5				
8				3	82	3	1			
9			1	11	77					
10			1	4	76	6	2			
11*	all				73	14	2			
12			1	4	80	4				
TOTAL										

An assessment of examiner concordance was made shortly after the scripts were marked. As there were significant differences in the marks awarded by the 2 examiners for question 11, the senior examiner remarked this question:

- Question 11 had relatively poor inter-examiner correlation (0.78)
- There was a mean absolute difference in marks >1.5
- Examiner A was more generous than examiner B in 87% of the scripts

Comparison to previous years (Table 15)

	Jan 13	May 13	Oct 13	Jan 14	May 14	Oct 14	Jan 15
Mean score	50%	57%	52%	47%	53%	50%	58%
Median score	52%	60%	54%	47%	55%	52%	62%
Reliability	0.93	0.93	0.93	0.9	0.93	0.94	0.92
SEM	5	5	4.6	4.2	4.9	4.3	4.6
Pass mark	53%	58%	60%	57%	56%	57%	61%
Pass rate	48%	54%	36%	25%	48%	38%	56%
Correlation with MCQ	0.79	0.72	0.84	0.79	0.78	0.76	0.77

The correlation between the two parts of the examination is acceptable at 0.77

Overall Results

To pass the Part 1 FRCOphth examination candidates 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 a poor performance 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 minimum mark required in order to meet standard 1 above for this examination was 142/240 (59%). The minimum mark required in each paper (to meet standard 2 above) was 64/120 in the MCQ paper and 68/120 in the CRQ paper.

Fifty-one candidates (57%) gained a total mark that met standard 1 above but 1 candidate failed to obtain the minimum mark required in the one of the papers and therefore failed the examination overall.

50/89 (56%) candidates passed the examination.

Distribution of scores (Table 16)

Range of marks	Distribution	Number
<60	//	2
61-70	/	1
71-80	//	2
81-90	/	1
91-100	//	2
101-110	////	4
111-120	//////	8
121-130	//////	6
131-140	//////	10
141-150	//////	15
151-160	//////	22
161-170	//////	8
171-180	//////	6
181-190	/	1
191-200	/	1
Total		89

Mean 139/240 (58%)

Median 146/240 (61%)

Range 54 – 191 (23%-80%)

Comparison to previous years: (Table 17)

Examination	Candidates	Passed examination	% Passed	MCQ pass mark %	CRQ pass mark %
Oct 2006	33	3	9	58	62
Jan 2007	24	4	16	60	43
May 2007	32	5	15	50	64
Oct 2007	56	13	23	51	59
Jan 2008	73	27	37	56	55
May 2008	66	16	24	57	48
Oct 2008	88	45	51	58	51
Jan 2009	79	37	47	61	57
July 2009	49	33	67	63	58
Oct 2009	101	56	56	62	56
Jan 2010	50	20	40	63	58
May 2010	79	31	39	60	57
Oct 2010	89	34	38	61	54
Jan 2011	62	23	37	59	58
May 2011	95	47	49	54	57
Oct 2011	122	63	52	56	56
Jan 2012	66	20	33	57	54
May 2012	104	53	51	56	58
Oct 2012	150	84	56	56	54
Jan 2013	91	47	52	57	53
May 2013	102	54	53	58	58
Oct 2013	151	65	43	58	60
Jan 2014	77	23	30	57	57
May 2014	119	55	46	58	56
Oct 2014	232	102	44	58	57
Jan 2015	89	50	56	58	61

Cumulative totals

Sitting	Candidates	Number passed	Pass rate (%)
January	611	251	41
May	597	261	44
October	989	479	48
All examinations	2108	941	45

Breakdown of results by training number (%) (Table 18)

	Failed	Passed	Total
In OST	13	21	34
Not in OST	26	29	55
Foundation	0	0	0
Total	39	50	89

These differences are not statistically significant (Fishers exact $p = 0.27$)

Breakdown of results by deanery (Table 19)

Deanery	Failed	Passed	Total
East Midlands	0	2	2
East of England	2	0	2
East of Scotland	0	0	0
KSS	0	1	1
London	2	4	6
Mersey	1	2	3
N Ireland	1	0	1
North of Scotland	0	0	0
North Western	2	2	4
Northern	0	1	1
Oxford	0	3	3
Peninsula	1	2	3
Severn	0	0	0
South East of Scotland	0	0	0
Wales	1	1	2
Wessex	0	0	0
West Midlands	1	0	1
West of Scotland	1	3	4
Yorkshire	1	0	1
Total	13	21	34

Breakdown of results by stage of training (Table 20)

Stage (includes FTSTA)	Failed	Passed	Total
Foundation yr 1			
Foundation yr 2			
ST1 (LAT or LAS)			
ST2			
ST3			
Total in OST			

*data not available for this sitting

Breakdown of results by gender (Table 21)

	Failed	Passed *	Total
Female	21	24	45
Male	18	25	43
Total	39	49	88

*Gender not declared by 1 candidate.

These differences are not statistically significant (Fishers exact, $p=0.67$)

Breakdown of results by country of qualification* (Table 22)

	Failed	Passed	Total
UK	14	19	33
Outside UK	18	14	32
Total	32	33	55

* not declared by 24 candidates

These differences are not statistically significant (Fishers exact $p=0.32$)

Breakdown of results by declared ethnicity (Table 23)

Ethnicity	Failed	Passed	Total
White	6	8	14
Non-white	17	26	43
Total	23	34	58

Ethnicity not declared by 31 candidates

These differences are not statistically significant (Fishers $p=1$)

Breakdown of results by first language (Table 24)

	Failed	Passed	Total
English	4	7	11
Other	4	2	6
Total	8	9	17

First language not declared by 72 candidates

Breakdown of results by number of attempts (Table 25)

Attempts	Failed	Passed	Total
1 (First)	19	24	43
2	12	15	27
3	6	6	12
4	2	3	5
5	0	0	0
6	0	1	1
7	0	1	1
Any resit	20	26	46
Total	39	50	89

Appendix 1 Overall results for each deanery

Result data by deanery has been available since October 2010. The summary results for each deanery are listed below:

Deanery	Total candidates	Pass rate %
East of Scotland	5	100
Oxford	12	75
Yorkshire	41	71
Severn	10	70
North of Scotland	6	67
South East of Scotland	17	65
East Midlands	24	62
KSS	21	62
Northern	21	62
North Western	20	60
London	87	56
Wales	28	50
West Midlands	54	50
West of Scotland	38	47
East of England	28	46
Wessex	39	46
Peninsula	16	43
Mersey	33	40
N Ireland	20	35
Total	520	55