Examination Report

May 2018 Part 1 Fellowship Exam of the Royal College of Ophthalmologists Examination

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Contents

1   Summary

The XX Part 1 FRCOphth examination took place in May 2018. 119 candidates sat the examination, of whom 64 (54%) fulfilled the criteria required to pass the examination overall.

The pass rate for candidates in ophthalmic specialist training is 57% compared to a 49% pass rate for non-trainees.

The multiple choice question (MCQ) exam had a reliability of XX and the constructed response question (CRQ) exam had a reliability of 0.93. The correlation between the two examinations was 0.78.

2   MCQ paper

The table below gives the paper contents compared to previous years.

Table 1:   MCQ paper content

Date	Anatomy / embryology	Optics	Pathology	Pharmacology & genetics	Physiology	Miscellaneous & investigations	Total
Oct 2014	24	24	23	18	23	8	120
Jan 2015	24	24	23	18	23	8	120
May 2015	24	24	23	18	23	8	120
Oct 2015	24	24	23	18	23	8	120
Jan 2016	24	23	23	18	23	8	119*
May 2016	24	24	22	18	23	8	119*
Oct 2016	24	24	23	18	23	8	120
Jan 2017	24	24	22	18	23	8	119*
May 2017	24	24	23	18	23	7	119*
May 18	24	24	23	18	23	8	120

* = questions removed

2.1   Paper statistics

Table 2:   MCQ paper summary statistics

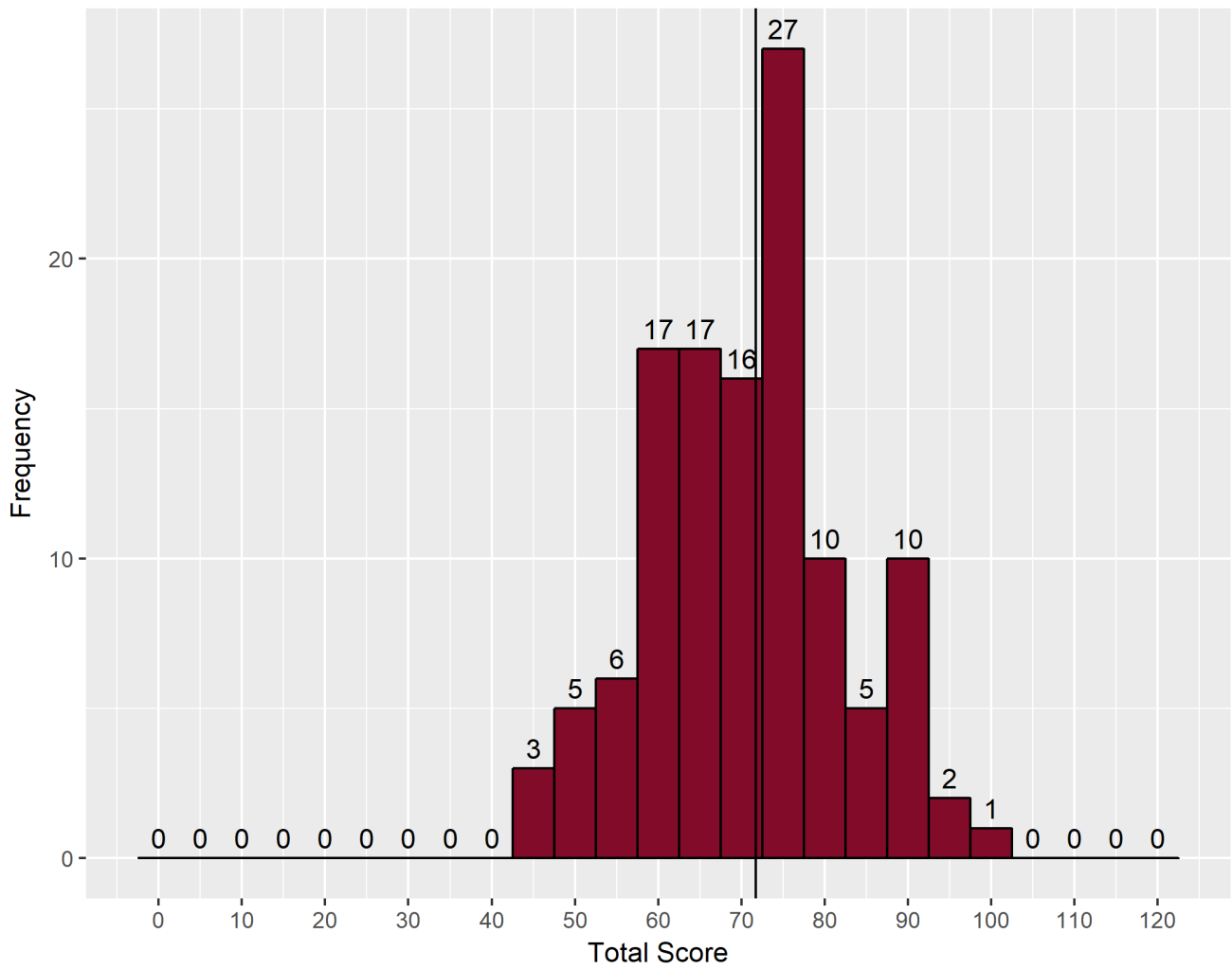| Statistic	Value	Percentage
Mean Score	70/120	59%
Median Score	71/120	59%
Standard Deviation	11.6	10%
Candidates	119	
Reliability: Cronbach alpha	0.83	
Standard error of measurement (SEM)	5	4%
Range of marks	43 - 98	36% -82%
Pass mark derived from Standard Setting	72/120	60%
Pass - 1 SEM	68/120	48%
Pass rate	59/119	50%

Figure 1:   *Distribution of Marks – MCQ*

The vertical line denotes the point on the mark distribution where the pass mark lies.

2.2   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:   MCQ paper quality

			Discrimination						Total	%
			Negative		Poor		Good			
			<0		0-0.249		>0.250			
			Number	%	Number	%	Number	%		
Facility	Difficult	<25%	6	5	2	2	1	1	9	8
	Moderate	25-75%	8	7	38	32	24	20	70	58
	Easy	>75%	1	1	21	18	19	16	41	34
	Total		15	12	61	51	44	37	120	100

2.3   Standard setting

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

Table 4:   MCQ Ebel Categories

	Difficult	Moderate	Easy	Total
Essential	3	14	47	64
Important	2	19	22	43
Supplementary	1	7	5	13
Total	6	40	74	120

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

Table 5:   MCQ Ebel Categories - Expert decision

	Difficult	Moderate	Easy
Essential	0.55	0.65	0.75
Important	0.45	0.50	0.55
Supplementary	0.25	0.25	0.25

Table 6:   MCQ Ebel Categories - Expert decision

	Difficult	Moderate	Easy	Total
Essential	1.65	9.10	35.25	46.00
Important	0.90	9.50	12.10	22.50
Supplementary	0.25	1.75	1.25	3.25
Total	2.80	20.35	48.60	71.75

The MCQ pass mark = 72/120 (60%)

Table 7: Comparison of pass marks and rates for previous MCQ papers

Statistic	May 14	Oct 14	Jan 15	May 15	Oct 15	Jan 16	May 16	Oct 16	Jan 17	May 17	May 18
Candidates	119	232	89	114	188	107	123	194	101	136	119
Mean score	67	72	69	72	68	69	70	71	64	69	70
Reliability (KR 20)	0.90	0.90	0.86	0.89	0.85	0.90	0.90	0.88	0.80	0.80	0.83
SEM	4.80	4.80	4.90	4.70	4.90	4.90	4.90	4.80		4.80	4.73
Standard setting	Ebel	Ebel	Ebel	Ebel	Ebel	Ebel	Ebel	Ebel	Ebel	Ebel	Ebel
Pass mark	69 (58%)	69 (58%)	69 (58%)	68 (57%)	71 (60%)	71 (59%)	71 (60%)	72 (60%)	71 (60%)	75 (63%)	72 (60%)
33% discrimination											
Negative	4	5	9	3	3	3	6	5		6	15
Poor (0-0.249)	43	40	56	47	59	55	34	49		63	61
Good (>0.250)	72	75	55	70	58	62	79	66		50	44
Facility											
Difficult (<25%)	6	3	9	5	6	6	3	9		8	9
Moderate	82	94	91	90	90	91	90	88		89	70
Easy (>75%)	31	23	20	25	24	23	26	23		22	41
Questions	119	120	120	120	120	119	119	120		119	120
Pass number (rate)	54 (45%)	144 (62%)	53 (60%)	73 (64%)	79 (42%)	47 (44%)	71 (58%)	72 (37%)		45 (33%)	59 (50%)

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3 CRQ paper

The table below gives the paper contents.

Table 8: CRQ paper content

Question	Subject	Topic	Subsections	Data provided
1	Anatomy	Bones of the orbit	1	CT Scan image of orbit
2	Pathology	Lacrimal tumour	7	Photograph of macroscopic biopsy specimen and histopathology slides
3	Pathology	Corneal pathogens	6	Low power image of corneal tissue as seen through a microscope
4	Optics*	Indirect Ophthalmoscope	4	None
5	Optics*	Prismatic effect of lenses	3	Picture of a Prism
6	Optics	Optical aberrations	6	3 ray diagrams
7	Optics*	Concave mirror	4	None
8	Investigations	Electro-oculogram	6	Graph showing amplitudes measured during an Electrooculogram
9	Investigations	Thyroid eye disease	6	Thyroid Function test results are shown in a table
10	Investigations	Visual Fields	5	Humphrey 24-2 field
11	Investigations	Genetics	6	Family Tree diagrams and a chromosomal array
12	Statistics	Interpreting statistical results in scientific papers	5	AJO extract of an ophthalmology paper
* Candidates are expected to draw a diagram as part of the answer				

3.1 Paper statistics

Table 9: CRQ paper summary statistics

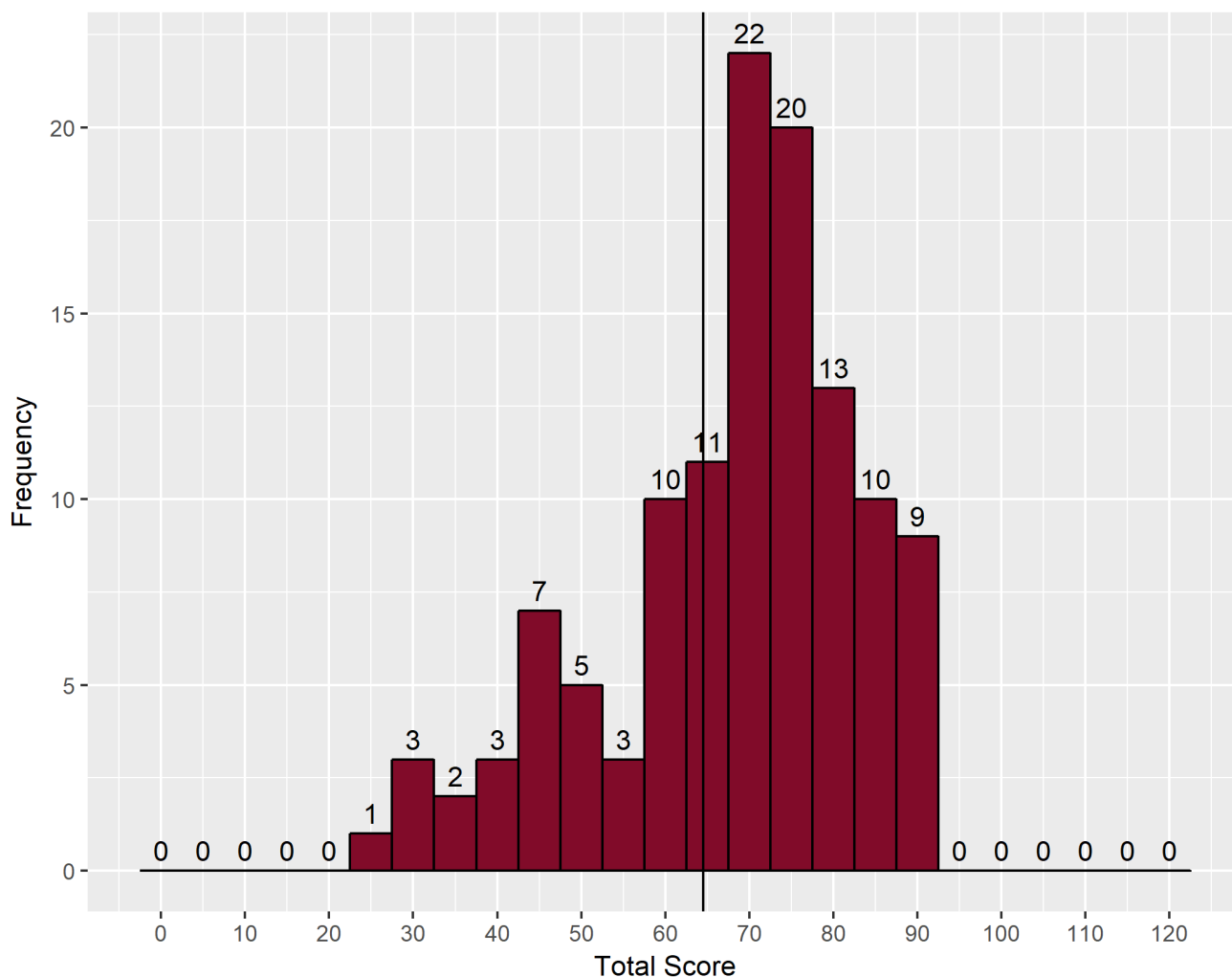| Statistic	Value	Percentage
Mean Score	68/120	57%
Median Score	71/120	59%
Standard Deviation	15.3	13%
Candidates	119	
Reliability: Cronbach alpha	0.93	
Standard error of measurement (SEM)	8	7%
Range of marks	23 - 91	19% -76%
Pass mark derived from Standard Setting	65/120	54%
Pass - 1 SEM	57/120	48%
Pass rate	84/119	71%

Figure 2:   *Distribution of Marks - CRQ*

The vertical line denotes the point on the mark distribution where the pass mark lies.

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) seen in the table below.

Table 10: Results for each question

Question	Subject	Mean	Median	Min	Max	SD	BCM
1	Anatomy	7.87	8.00	4	10	1.46	6.50
2	Pathology	5.39	6.00	1	9	1.60	5.00
3	Pathology	5.48	5.00	2	8	1.56	5.00
4	Optics*	4.63	5.00	0	9	1.85	5.00
5	Optics*	7.02	8.00	0	10	2.60	6.00
6	Optics	5.44	6.00	0	9	1.63	5.00
7	Optics*	6.07	7.00	0	10	2.74	6.00
8	Investigations	5.90	6.00	1	10	2.22	5.50
9	Investigations	7.10	7.00	1	10	1.94	6.50
10	Investigations	5.09	5.00	0	10	2.53	4.75
11	Investigations	4.48	4.00	0	8	1.65	5.00
12	Statistics	5.65	6.00	0	10	2.10	5.50

Candidates performed badly in or were particularly ill prepared for question 11 (Investigations).

3.2   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 11: CRQ standard setting

Question	Topic	Examiner A				Examiner B			
		No. Fail	No. Border	No. Pass	Median Border	No. Fail	No. Border	No. Pass	Median Border
1	Anatomy	3	98	18	6	14	74	31	7
2	Pathology	43	41	35	5	34	39	46	5
3	Pathology	39	49	31	5	23	54	42	5
4	Optics*	52	44	23	5	75	20	24	6
5	Optics*	29	79	11	6	26	80	13	6
6	Optics	26	74	19	5	24	66	29	5
7	Optics*	40	56	23	6	44	61	14	6
8	Investigations	44	51	24	6	20	57	42	5
9	Investigations	28	66	25	6	23	65	31	6
10	Investigations	30	57	32	4.5	31	41	47	5
11	Investigations	50	22	47	5	42	26	51	4
12	Statistics	21	65	33	5	27	30	62	5
Total	Total	405	702	321	64.5	383	613	432	65

Table 12: Comparison to previous years

Date	Mean score	Median score	Reliability	SEM	Pass mark	Pass rate	Correlation with MCQ
Oct 14	50%	52%	0.94	4.3	57%	38%	0.76
Jan 15	58%	62%	0.92	4.6	61%	56%	0.77
May 15	51%	52%	0.93	4.6	54%	49%	0.75
Oct 15	48%	50%	0.94	4.3	59%	28%	0.81
Jan 16	48%	50%	0.94	3.0	54%	32%	0.80
May 16	51%	54%	0.94	4.5	56%	41%	0.85
Oct 16	50%	50%	0.93	4.0	59%	30%	0.83
Jan 17	49%	51%	0.92	4.0	51%	50%	?
May 17	57%	58%	0.92	5.0	53%	67%	0.76
May 18	57%	59%	0.93	8.1	54%	71%	0.78

4 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 one 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 137/240 (57%). The minimum mark required in each paper (to meet standard 2 above) was 72/120 in the MCQ paper and 65/120 in the CRQ paper.

Sixty four (54%) gained a total mark that met standards 1 and 2 above. Eight candidates achieved 137/240 or greater but failed to achieve 72/120 in the MCQ paper.

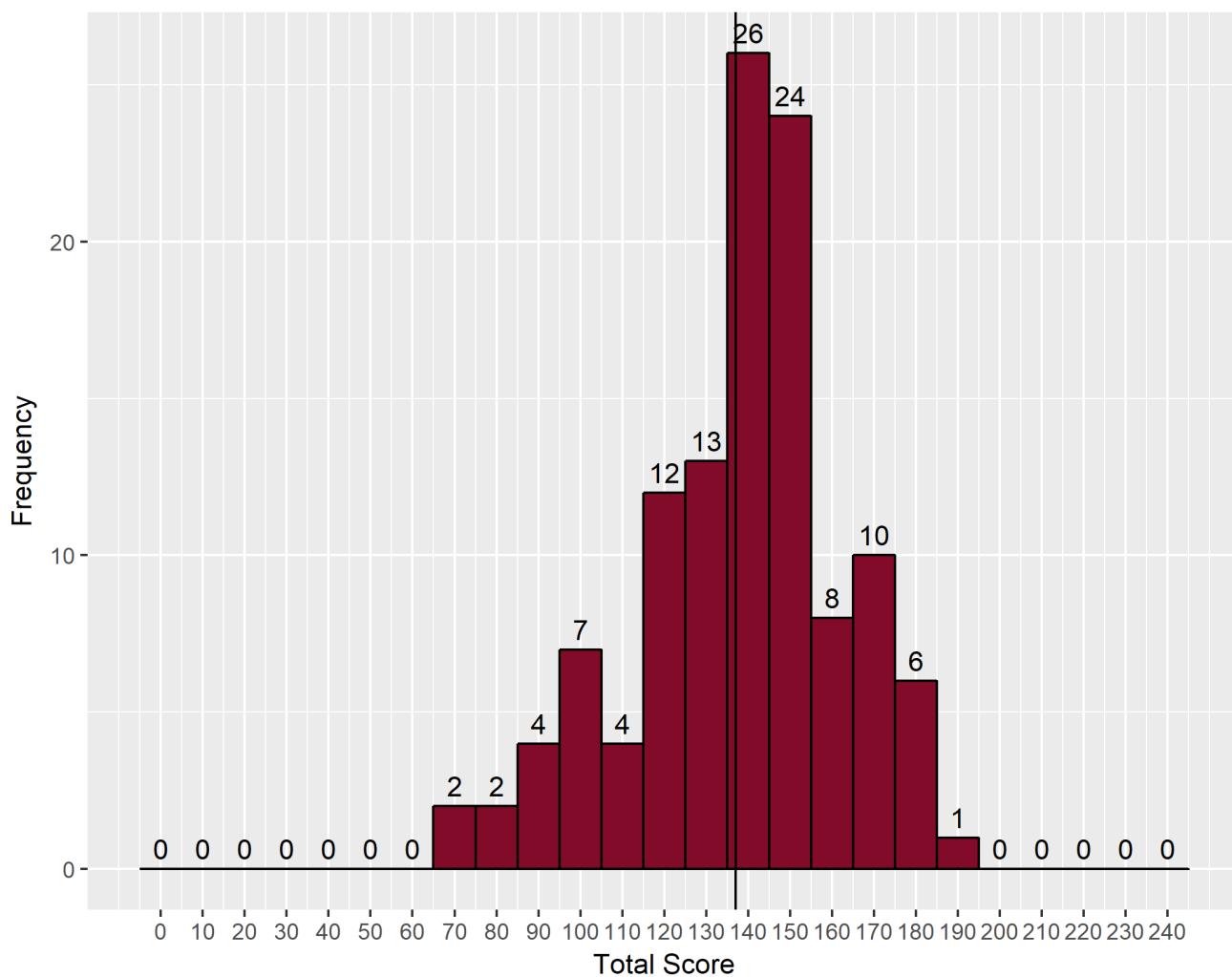**64/119 (54%) candidates passed the examination.**

Figure 3:   *Distribution of Marks - Combined*

The vertical line denotes the point on the mark distribution where the pass mark lies.

4.1   Comparison to previous Part 1 examinations

Table 13: Comparison to previous years

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
May 2015	114	62	54	57	54
Oct 2015	188	57	30	59	59
Jan 2016	107	36	34	59	54
May 2016	123	61	50	60	56
Oct 2016	194	70	36	60	59
Jan 2017	101	38	38	60	51
May 2017	136	62	46	63	53
May 2018	119	64	54	60	54

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Table 14: Comparison to previous years

Sitting	Candidates	Number passed	Pass rate (%)
January	819	325	252
May	1089	510	214
October	1371	606	226
Total	3279	1441	228

4.2   Breakdown of Results

Table 15: Breakdown of results by training number (%)

Training	Failed	Passed	Total
In OST	15	20 (57%)	35
Not in OST	39	38 (49%)	77
Total	54	58 (52%)	112

Table 16: Breakdown of results by deanery

Deanery	Failed	Passed	Total
East of England	3	1	4
East of Scotland	1	1	2
Eire	2	0	2
Europe and Overseas	0	1	1
KSS	1	1	2
London	1	3	4
North of Scotland	1	0	1
North Western	0	1	1
Northern	2	1	3
Northern Ireland	0	1	1
Peninsula	0	1	1
South East of Scotland	0	1	1
Wales	0	1	1
Wessex	0	1	1
West Midlands	3	2	5
Yorkshire	1	2	3
Total	15	18	33

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Table 17: Breakdown of results by stage of training

Stage	Failed	Passed	Total
FY2	4	3 (43%)	7
MO ST5	1	0 (0%)	1
OST1	7	12 (63%)	19
OST2	3	4 (57%)	7
OST3	0	1 (100%)	1
Total	15	20 (57%)	35

Table 18: Breakdown of results by number of attempts

Attempt	Failed	Passed	Total
1	27	40	67
2	14	15	29
3	8	4	12
4	3	2	5
5	2	2	4
6	1	1	2
Total	55	64	119

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.

Table 19: Cumulative pass by deanery

Deanery	Total candidates passed	Total candidates	Pass rate %
East Midlands	37	69	54
East of England	44	95	46
East of Scotland	10	11	91
Eire	0	2	0
Europe and Overseas	2	5	40
KSS	34	59	58
London	124	220	56
Mersey	41	99	41
North of Scotland	16	36	44
North Western	32	52	62
Northern	30	59	51
Northern Ireland	28	74	38
Oxford	18	28	64
Peninsula	26	61	43
Severn	14	21	67
South East of Scotland	21	35	60
Wales	40	87	46
Wessex	45	98	46
West Midlands	69	149	46
West of Scotland	52	99	53
Yorkshire	50	76	66
Total	733	1435	51

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