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FROM THE EXAMINATIONS DEPARTMENT

Public Report on the Part 2 FRCOphth Written Examination February 2012

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Public report on the Part 2 FRCOphth examination

The written papers of the eighth sitting of the Part 2 FRCOphth examination were held on Monday 27 February 2012.

The candidates

104 candidates presented themselves for the examination.

The written papers

The written papers consisted of a 2-hour, 90 question single best answer from 4 MCQ paper and a 45 stem, 90-question EMQ paper lasting 3 hours. Candidates must pass the written papers to be allowed to sit the clinical part of the examination. To pass, candidates must gain a total score from both papers that equals or exceeds the combined marks from the Ebel standard setting process. They must also gain at least the pass mark minus 1 SEM in each paper.

As part of the quality management of the College's assessment process, the written papers are reviewed by the senior examiner after marking, but before the results are known.

The Part 2 FRCOphth Examination Sub-Committee reviewed all of the questions with negative 33% item discrimination and low facility.

The MCQ paper

Table 1 Content (Blueprint)

| | | Sept 2010 | Feb 2011 | Sept 2011 | Feb 2012 |
|--------------------------------------|--|-----------|-----------|-----------|-----------|
| Basic science | | 22 | 16 | 21 | 15 |
| | Anatomy & embryology | 2 | 4 | 3 | 2 |
| | Microbiology | 3 | 3 | 3 | 3 |
| | Optics | 7 | 2 | 2 | 2 |
| | Genetics | 1 | 2 | 6 | 2 |
| | Pathology | 6 | 5 | 5 | 4 |
| | Physiology | 3 | 0 | 2 | 2 |
| Clinical ophthalmology | | 29 | 32 | 29 | 35 |
| | Cataract | 2 | 3 | 2 | 3 |
| | Neurology & pupils | 5 | 4 | 5 | 5 |
| | Glaucoma | 3 | 3 | 1 | 4 |
| | Strabismus | 3 | 3 | 2 | 2 |
| | Paediatrics | 2 | 2 | 5 | 3 |
| | Vitreo-retinal | 2 | 4 | 1 | 2 |
| | Medical retina & uveitis | 5 | 4 | 3 | 6 |
| | Oculoplastics and orbit | 2 | 3 | 3 | 4 |
| | Cornea & external eye | 4 | 4 | 4 | 4 |
| | Oncology | 1 | 2 | 3 | 1 |
| | Trauma | 0 | 0 | 0 | 1 |
| Management & therapeutics | Pharmacology & therapeutics | 9 | 8 | 6 | 6 |
| Investigations | | 13 | 17 | 18 | 19 |
| Miscellaneous | | 16 | 16 | 15 | 15 |
| | EBM and research | 8 | 7 | 7 | 5 |
| | Medicolegal/Ethics | 3 | 3 | 2 | 3 |
| | Health economics | 1 | 1 | 1 | 1 |
| | General medicine | 1 | 1 | 1 | 2 |
| | Guidelines | 3 | 4 | 4 | 4 |
| Total | | 89 | 89 | 89 | 90 |

MCQ paper statistics:

| | |
|--|--------------|
| Mean score: | 53/90 |
| Median score: | 54/90 |
| Standard deviation: | 7.5 |
| Candidates: | 104 |
| KR20: (measurement of reliability) | 0.7 |
| Standard error of measurement (SEM): | 4.2 |
| Range of marks: | 33-70 |
| Pass mark derived from Standard Setting: | 52/90 (58%) |
| Pass mark – 1 SEM | 48/90 |
| Pass rate: | 63/104 (61%) |

Table 2 Distribution of scores:

| Score | Distribution | Total |
|-------|-----------------------------|-------|
| 31-35 | // | 2 |
| 36-40 | //// | 4 |
| 41-45 | ///// ///// /// | 13 |
| 46-50 | ///// ///// ///// ///// / | 21 |
| 51-55 | ///// ///// ///// ///// // | 23 |
| 56-60 | ///// ///// ///// ///// /// | 23 |
| 61-65 | ///// ///// ///// / | 16 |
| 66-70 | // | 2 |
| TOTAL | | 104 |

Analysis of questions

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

Table 3

| | Difficult (<26 correct) | Moderate (25-74) Correct) | Easy (>75 correct) | Total |
|----------------------------------|-------------------------------|---------------------------------|--------------------------|-------|
| Negative discrimination | 1 | 2 | 1 | 4 |
| Poor discrimination (0-0.19) | 9 | 24 | 16 | 49 |
| Good discrimination (0.2-0.5) | 0 | 28 | 9 | 37 |
| Total | 10 | 54 | 26 | 90 |

Standard setting for MCQ paper (Ebel method)**Table 4: Classification of the questions:**

| | Difficult | Moderate | Easy | |
|---------------|-----------|----------|------|----|
| Essential | 1 | 14 | 16 | 31 |
| Important | 5 | 17 | 20 | 42 |
| Supplementary | 1 | 7 | 9 | 17 |
| Total | 7 | 38 | 45 | 90 |

Table 5: Percentage correct by borderline candidates

| | Difficult | Moderate | Easy |
|---------------|-----------|----------|------|
| Essential | 0.6 | 0.7 | 0.8 |
| Important | 0.5 | 0.55 | 0.6 |
| Supplementary | 0.25 | 0.3 | 0.3 |

Table 6: Weighted score

| | Difficult | Moderate | Easy | |
|---------------|-----------|----------|------|-------|
| Essential | 0.6 | 9.8 | 12.8 | 23.2 |
| Important | 2.5 | 9.35 | 12 | 23.85 |
| Supplementary | 0.25 | 2.1 | 2.7 | 5.05 |
| Total | 3.35 | 21.25 | 27.5 | 52.1 |

MCQ pass mark: 52/90 (58%)

Comparison of pass marks and pass rates for last 7 MCQ papers

Table 7

| | Feb 2009 | Sept 2009 | Feb 2010 | Sept 2010 | Feb 2011 | Sept 2011 | FEB 2012 |
|---------------------|----------|-----------|----------|-----------|----------|-----------|----------|
| Candidates | 15 | 16 | 21 | 26 | 46 | 77 | 104 |
| Mean score | 63% | 60% | 61% | 63% | 65% | 65% | 59% |
| Reliability (KR 20) | 0.8 | 0.8 | 0.8 | 0.8 | 0.7 | 0.7 | 0.7 |
| SEM | 4.1 | 4.0 | 3.9 | 3.9 | 4.0 | 3.8 | 4.2 |
| Standard setting | | | | | | | |
| Pass mark | 64% | 64% | 66% | 65% | 65% | 58% | 58% |
| Modified pass mark | 60% | 60% | 61% | NA | NA | NA | NA |
| 33% discrimination | | | | | | | |
| Negative | 8 | 12 | 8 | 12 | 15 | 4 | 4 |
| Poor | 23 | 31 | 26 | 35 | 37 | 54 | 49 |
| Good | 59 | 47 | 56 | 43 | 37 | 31 | 37 |
| Facility | | | | | | | |
| Difficult (<25%) | 10 | 13 | 14 | 6 | 5 | 6 | 10 |
| Moderate | 38 | 42 | 43 | 46 | 51 | 43 | 54 |
| Easy (>75%) | 42 | 35 | 33 | 38 | 33 | 40 | 26 |
| | | | | | | | |
| Pass rate | 60% | 50% | 52% | 50% | 54% | 81% | 61% |

The EMQ paper

Content (Blueprint)

The subjects that were assessed in the EMQ paper are summarised below:

Table 8

| | | Sept 2010 | Feb 2011 | Sept 2011 | Feb 2012 |
|-------------------------------|-------------------------|-----------|----------|-----------|----------|
| Clinical ophthalmology | | 40 | 51 | 42 | 50 |
| | Uveitis | 2 | 6 | 2 | 6 |
| | Paediatrics | 4 | 4 | 4 | 4 |
| | Vitreo-retinal | 2 | 6 | 6 | 2 |
| | Medical retina | 8 | 8 | 4 | 8 |
| | Strabismus | 4 | 4 | 4 | 6 |
| | Oculoplastics and orbit | 4 | 4 | 4 | 4 |
| | Cornea/external eye | 6 | 7 | 8 | 8 |
| | Trauma | 2 | 4 | 4 | 4 |
| | Cataract/lens | 4 | 4 | 2 | 4 |
| | Glaucoma | 4 | 4 | 4 | 4 |
| Neurology and medicine | | 16 | 12 | 14 | 16 |
| | Neurology | 12 | 10 | 12 | 12 |
| | Medicine | 4 | 2 | 2 | 4 |
| Basic sciences | | 10 | 6 | 8 | 8 |
| | Pathology/genetics | 6 | 4 | 6 | 4 |
| | Optics/refraction | 2 | 2 | 2 | 2 |
| | Anatomy/physiology | 2 | 0 | 0 | 2 |
| Pharmacology and therapeutics | Pharmacology | 12 | 11 | 14 | 10 |
| Investigations | | 12 | 4 | 8 | 2 |
| Miscellany | Research & statistics | 0 | 4 | 4 | 4 |
| Total | | 90 | 88 | 90 | 90 |

EMQ paper statistics:

| | |
|--|--------------|
| Mean score: | 55/90 |
| Median score: | 55/90 |
| Standard deviation: | 7.3 |
| Candidates: | 104 |
| KR20: (measurement of reliability) | 0.72 |
| Standard error of measurement (SEM): | 3.87 |
| Range of marks: | 38-71 |
| Pass mark derived from Standard Setting: | 52/90 (58%) |
| Pass mark – 1 SEM | 48 |
| Pass rate: | 71/104 (68%) |

Distribution of scores:

Table 9

| Score | Distribution | Number |
|-------|----------------------------|--------|
| 36-40 | //// | 5 |
| 41-45 | //// /// | 8 |
| 46-50 | //// //// //// / | 16 |
| 51-55 | //// //// //// //// //// / | 26 |
| 56-60 | //// //// //// //// //// / | 26 |
| 61-65 | //// //// //// /// | 18 |
| 66-70 | //// | 4 |
| 71-75 | / | 1 |
| TOTAL | | 104 |

Analysis of questions

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

Table 10

| | Difficult (<26 correct) | Moderate (25-74) Correct) | Easy (>75 correct) | Total |
|----------------------------------|-------------------------------|---------------------------------|--------------------------|-------|
| Negative discrimination | 0 | 2 | 2 | 4 |
| Poor discrimination (0-0.19) | 12 | 13 | 22 | 47 |
| Good discrimination (0.2-0.5) | 0 | 28 | 11 | 39 |
| Total | 12 | 43 | 35 | 90 |

Standard setting for EMQ paper (Ebel method)

Table 11: Classification of the questions:

| | Difficult | Moderate | Easy | |
|---------------|-----------|----------|------|----|
| Essential | 0 | 19 | 22 | 41 |
| Important | 3 | 17 | 5 | 25 |
| Supplementary | 2 | 15 | 7 | 24 |
| Total | 5 | 51 | 34 | 90 |

Table 12: Percentage correct by borderline candidates

| | Difficult | Moderate | Easy |
|---------------|-----------|----------|------|
| Essential | 0.6 | 0.7 | 0.8 |
| Important | 0.5 | 0.55 | 0.6 |
| Supplementary | 0.25 | 0.3 | 0.3 |

Table 13: Weighted score

| | Difficult | Moderate | Easy | |
|---------------|-----------|----------|------|-------|
| Essential | 0 | 13.3 | 17.6 | 30.9 |
| Important | 1.5 | 9.35 | 3 | 13.85 |
| Supplementary | 0.5 | 4.5 | 2.1 | 7.1 |
| Total | 2 | 27.15 | 22.7 | 51.85 |

EMQ pass mark: 52/90 (58%)

Comparison of pass marks and pass rates for last 7 EMQ papers

Table 14

| | Feb 2009 | Sept 2009 | Feb 2010 | Sept 2010 | Feb 2011 | Sept 2011 | Feb 2012 |
|---------------------|----------|-----------|----------|-----------|----------|-----------|----------|
| Candidates | 15 | 16 | 21 | 26 | 46 | 77 | 104 |
| Mean score | 52% | 61% | 59% | 64% | 61% | 59% | 61% |
| Reliability (KR 20) | 0.9 | 0.8 | 0.9 | 0.8 | 0.7 | 0.7 | 0.72 |
| SEM | 4.0 | 3.9 | 4.0 | 3.9 | 3.9 | 3.9 | 3.87 |
| Standard setting | | | | | | | |
| Pass mark | 63% | 67% | 66% | 64% | 65% | 59% | 58% |
| Modified pass mark | 54% | 62% | 61% | NA* | NA | NA | NA |
| 33% discrimination | | | | | | | |
| Negative | 4 | 8 | 6 | 7 | 9 | 6 | 4 |
| Poor | 15 | 27 | 34 | 35 | 32 | 53 | 47 |
| Good | 71 | 55 | 50 | 48 | 47 | 31 | 39 |
| Facility | | | | | | | |
| Difficult (<25%) | 22 | 19 | 10 | 7 | 10 | 12 | 12 |
| Moderate | 42 | 43 | 49 | 45 | 47 | 47 | 43 |
| Easy (>75%) | 28 | 28 | 31 | 38 | 31 | 31 | 35 |
| | | | | | | | |
| Pass rate | 47% | 31% | 48% | 54% | 43% | 49% | 68% |

Overall results from the written papers

To pass the Part 2 FRCOphth written 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 **104/180 (58%)**. The minimum mark required in each paper (to meet standard 2 above) was 48/90 in the MCQ paper and 48/90 in the EMQ paper.

68 candidates gained a total mark that met standard 1 above. All candidates achieved standard 2 in the EMQ paper and hence passed the written part of the examination overall.

68 candidates (65%) passed the written examination and were invited to sit the oral examination.

Table 15 Distribution of marks:

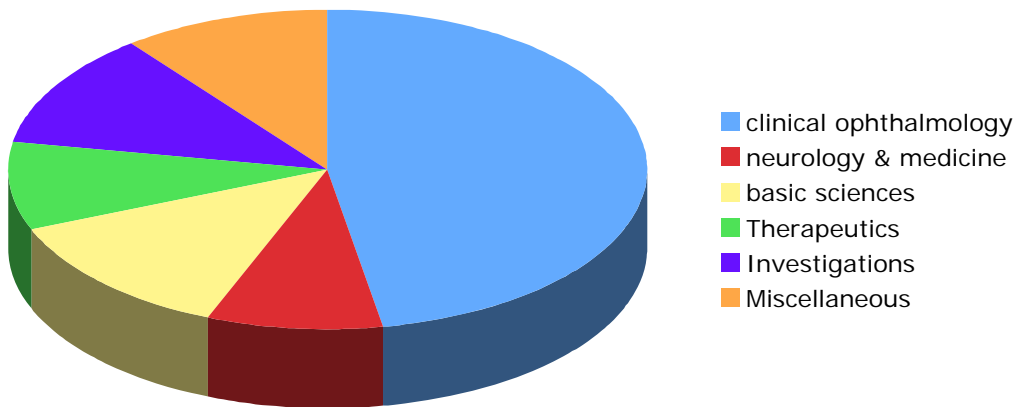
| | Distribution | Mark |
|---------|--------------|-------------------------------|
| 61-70 | 61-70 | |
| 71-80 | 71-80 | //// |
| 81-90 | 81-90 | //// /// |
| 91-100 | 91-100 | //// //// //// //// |
| 101-110 | 101-110 | //// / //// //// //// //// / |
| 111-120 | 111-120 | //// //// //// //// //// //// |
| 121-130 | 121-130 | //// //// //// |
| 131-140 | 131-140 | // |
| 141-150 | 141-150 | |
| Total | Total | |

Correlation between MCQ and EMQ papers = 0.7

Table 16 Combined blueprint from both papers

| Theme | Topic | Feb 2011 | Sept 2011 | Feb 2012 |
|---------------------------------|---------------------------------------|------------|------------|------------|
| Clinical ophthalmology | | 79 | 66 | 80 |
| | Retina and uveitis | 18 | 9 | 20 |
| | Paediatrics and strabismus | 13 | 15 | 15 |
| | Vitreoretinal | 10 | 7 | 4 |
| | Oculoplastics and orbit | 7 | 7 | 8 |
| | Cornea/external eye | 11 | 12 | 12 |
| | Trauma | 4 | 4 | 5 |
| | Cataract/lens | 7 | 4 | 7 |
| | Glaucoma | 7 | 5 | 8 |
| | Oncology | 2 | 3 | 1 |
| Neurology & medicine | | 17 | 19 | 23 |
| | Neurology | 14 | 17 | 17 |
| | Medicine | 3 | 2 | 6 |
| Basic sciences | | 22 | 29 | 23 |
| | Pathology/genetics | 14 | 20 | 13 |
| | Optics/refraction | 4 | 4 | 4 |
| | Anatomy/physiology | 4 | 5 | 6 |
| Therapeutics | Therapeutics | 19 | 20 | 16 |
| Investigations | Ophthalmic & Neuro-imaging | 21 | 26 | 21 |
| Miscellaneous | | 19 | 19 | 17 |
| | Statistics, research, epidemiology | 11 | 11 | 9 |
| | Economics, ethics, law, guides | 8 | 8 | 8 |
| Total | | 177 | 179 | 180 |

written paper blueprint



Breakdown of Written Results

Table 17 Breakdown of written results by training

| | Failed | Passed | Total |
|------------|--------|--------|-------|
| In OST | 27 | 58 | 85 |
| Not in OST | 9 | 10 | 19 |
| Total | 36 | 68 | 104 |

These differences are not statistically significant (p= 0.29)

Table 18 Breakdown of written results by stage of training

| | Failed | Passed | Total |
|-----|--------|--------|-------|
| ST3 | 0 | 1 | 1 |
| ST4 | 3 | 3 | 6 |
| ST5 | 7 | 19 | 26 |
| ST6 | 8 | 13 | 21 |
| ST7 | 6 | 9 | 15 |
| | 24 | 45 | 69* |

* Stage of training unknown for 16 candidates

Table 19 Breakdown of results by deanery

| | Passed | Total | Pass rate |
|----------------------------|--------|-------|-----------|
| East Midlands (North) | 3 | 3 | 100% |
| East of England | 3 | 3 | 100% |
| London | 17 | 24 | 71% |
| Mersey | 2 | 3 | 67% |
| North Western | 6 | 10 | 60% |
| Northern | 3 | 5 | 60% |
| N Ireland | 3 | 3 | 100% |
| Oxford | 3 | 3 | 100% |
| Peninsula | 2 | 5 | 50% |
| Scotland North | 0 | 1 | 0% |
| Scotland SE | 0 | 1 | 0% |
| Scotland West | 1 | 2 | 50% |
| Severn | 3 | 4 | 75% |
| South Yorks & South Humber | 2 | 3 | 67% |
| West Midlands | 1 | 4 | 25% |
| Wales | 5 | 6 | 83% |
| Wessex | 2 | 3 | 57% |
| Yorkshire | 1 | 2 | 50% |
| TOTAL | 57 | 85 | 67% |

Table 20 Breakdown of written results by gender

| | Failed | Passed | Total |
|--------|--------|--------|-------|
| Female | 10 | 17 | 27 |
| Male | 26 | 51 | 77 |
| Total | 36 | 68 | 104 |

These differences are not statistically significant (p=0.81)

Table 21 Breakdown of written results by country of qualification

| | Failed | Passed | Total |
|---|--------|--------|-------|
| UK | 17 | 43 | 60 |
| Outside UK (Inc Republic of Ireland) | 19 | 25 | 44 |
| Total | 36 | 68 | 104 |

These differences are not statistically significant (p=0.15)

Table 22 Breakdown of written results by stated ethnicity

| | Failed | Passed | Total |
|---------------|--------|--------|-------|
| Asian | 17 | 34 | 51 |
| Black | 2 | 1 | 3 |
| Chinese | 2 | 5 | 7 |
| Mixed/Other | 3 | 8 | 11 |
| White British | 4 | 12 | 16 |
| White other | 8 | 7 | 15 |
| Unknown | 0 | 1 | 1 |
| Total | 36 | 68 | 104 |
| | | | |
| Non-white | 24 | 48 | 72 |
| White | 12 | 19 | 31 |

Table 23 Breakdown of written results by first language

| | Failed | Passed | Total |
|---------|--------|--------|-------|
| English | 23 | 48 | 71 |
| Other | 12 | 17 | 29 |
| Total | 35 | 65 | 100* |

*First language unknown for 4 candidates

These differences are not statistically significant (p=0.49)

Table 24 Breakdown of results by number of attempts

| Attempt | Failed | Passed | Pass rate | Total |
|----------------|--------|--------|-----------|-------|
| 1 (first) | 24 | 42 | 64% | 66 |
| 2 | 7 | 19 | 34% | 56 |
| 3 | 3 | 4 | 57% | 7 |
| 4 | 1 | 2 | 67% | 3 |
| 5 | 1 | 0 | 0% | 1 |
| 6 | 0 | 1 | 100% | 1 |
| Any re-attempt | 12 | 26 | 38% | 68 |

Comparison with the written papers from previous examinations

Table 25

| Examination | Candidates | Pass mark | Pass rate |
|----------------|------------|-----------|-----------|
| September 2008 | 7 | 63% | 86% |
| February 2009 | 15 | 59% | 53% |
| September 2009 | 16 | 61% | 38% |
| February 2010 | 21 | 65% | 48% |
| September 2010 | 26 | 65% | 58% |
| February 2011 | 46 | 65% | 46% |
| September 2011 | 77 | 59% | 68% |
| February 2012 | 104 | 58% | 65% |

Comments

There has been a welcome increase in the number of candidates who present themselves for the examination, and the number who pass the written components.

The reliability of the two papers is still less than that required by the GMC. From 2013 the written examination will consist of a single MCQ paper with a larger number of questions, which should result in an increase in reliability.

The pass rate in the MCQ paper was lower than normal, even though the pass mark was less than 60%. In contrast, candidates performed well in the EMQ paper, with the highest ever pass rate.

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April 2012

Appendix 1 Hofstee pass mark

As a comparison to the pass mark identified using the Ebel method, the pass mark identified using the Hofstee method illustrated below:

| | |
|--------------------|------|
| Maximum fail rate | 50% |
| (Minimum pass rate | 50%) |
| Minimum fail rate | 20% |
| (Maximum pass rate | 80%) |

| | | |
|-------------------|-----|-----------|
| Maximum pass mark | 65% | (117/180) |
| Minimum pass mark | 50% | (90/180) |

(These values have been identified by the author and do not necessarily represent the views of the Part 2 sub-committee)

Hofstee pass mark 58% (104/180)

This pass mark is identical to the pass mark identified using the Ebel method.

