OCR
RECOGNISING ACHIEVEMENT

FSMQ

Foundations of Advanced Mathematics (MEI)

Free Standing Mathematics Qualification **6989**

OCR Report to Centres

January 2012

6989/R/12J

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This report on the examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the examination.

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Foundations of Advanced Mathematics (MEI) FSMQ (6989)

OCR REPORT TO CENTRES

Foundations of Advanced Mathematics – 6989

Report, January 2012

There were around 500 entries this session. The mean mark was 23.2, very similar to last January. The lowest mark on this paper was 7. One candidate achieved full marks, 11 scored 37 to 39.

In this paper there were 28 questions in which at least one candidate offered no response; there were a number of questions where 3 or 4 candidates did not give a response.

In all but one question, each of the distracting answers was selected by at least one candidate, although there were a number where the number of responses was less than 10. In Question 6, no candidate selected response B.

In 4 questions an incorrect response was chosen by a majority of candidates.

Q3 (Arithmetic – Conversion of metric units)
A significant minority chose the conversion of cm per second to km per hour as being incorrect rather than the conversion of squared units. It is worth noting that the same was true in the paper in January 2011.

Q25 (Graphs – Gradient of curve)
The correct answer was A: the gradient is approximately –5. In the graph given the scale of the *y*-axis was 10 to every cm and in missing this point, candidates preferred response B: –0.5.

Q28 (Trigonometry – Vectors)
Response C was favoured by 57% while the incorrect statement was given in response A, chosen by only 17%. The angle between **c** and **i** is approximately 143.1^{o} while **i** + **j** is not a unit vector.

Q39 (Algebra – Simplifying algebraic fractions)
The subtraction of a fraction in which there was a negative sign threw 38% of candidates who thought that Andrew was right, while only 27% correctly thought Andrew was wrong.

In 11 further questions the correct response was chosen by a minority of candidates.

Q10 (Algebra – Quadratic expressions)
The choices were distributed over all responses including 21% who asserted that $x^2 + 9$ was not a quadratic expression.

Q17 (Trigonometry – Techniques)
The distractors included a standard form of the area of a triangle, the statement of the sine rule in a particular case and a tan ratio. In each case more than 10% thought it incorrect.

Q21 (Arithmetic – Mensuration)
The capacity of the cylinder is 395.8 litres – only 45% found this to be so.

Q22 (Arithmetic – Ratios and percentages)
In this question also, the percentage selecting each of the distractors exceeded 10%.

Q27 (Algebra – Rearrangement of formulae)
Only a very small number chose A as the incorrect rearrangement, but the remainder chose the others in equal proportions.

Q29 (Algebra – Solution of inequalities)
Although response C was the most popular, only just over a third of candidates chose it, with B and D not far behind.

Q34 (Algebra – Construction of formula from words)
Given the units involved it is surprising that more candidates did not choose a response with a fraction of *m* and *s*. In fact, only 4 more candidates chose B than those that chose D.

Q35 (Graphs – Scale drawing)
The response C involves squared units, which is not dissimilar to Q3. Only 2% fewer candidates decided that response B gave the incorrect answer. Pythagoras (or measurement) gives AB = $\sqrt{8} \approx 2.8$ cm which, when multiplied by 50 000 gives 1.4 km.

Q36 (Statistics – Probability)
The probability that Dina will be secretary depends on her not being chosen for Chairperson. Although response B was the most popular the percentage was only just over a third with D very close behind.

Q37 (Trigonometry – Techniques)
Just over a third made the correct choice here with the rest evenly divided between the other responses.

Q38 (Graphs – Information and gradient)
Very nearly 50% of candidates decided that at $x = 0$, in spite of there being a turning point, the value of *y* was not the smallest.

As in previous sessions I offer a summary of questions and topics with the approximate percentage of candidates giving the correct responses.

	Question	Topic
91 – 100%	4	Arithmetic – Accuracy
	6	Statistics – Sampling
81 – 90%	1	Arithmetic – Numerical techniques
	5	Graphs – Conversion graph
	14	Arithmetic – Ratios
	16	Arithmetic – Change of units
	19	Arithmetic – Standard form
71 – 80%	7	Algebra – Solution of linear equation
	9	Algebra – Evaluation
	24	Trigonometry – Vectors
	31	Algebra – Brackets
	32	Statistics – Cumulative frequency
	40	Algebra – Sequences
61 – 70%	2	Arithmetic – Numerical terms
	8	Statistics – Central tendency
	11	Graphs – Information
	26	Algebra – Solutions of quadratic equations

51 – 60%	12	Statistics – Probability
	13	Algebra – Techniques
	18	Algebra – Factors of quadratic expressions
	20	Arithmetic – Fractions
	23	Algebra – Solution of quadratic equations
	30	Graphs – Speed/time graph
	33	Trigonometry – 3D shape
41 – 50%	10	Algebra – Quadratic expressions
	15	Arithmetic – Accuracy
	21	Arithmetic – Mensuration
	22	Arithmetic – Ratios and percentages
	38	Graphs – Information and gradient
31 – 40%	3	Arithmetic – Conversion of metric units
	17	Trigonometry – Right-angled triangle and the sine rule
	27	Algebra – Rearrangement of formulae
	29	Algebra – Solution of equations
	34	Algebra – Formulae from words
	35	Graphs – Scale drawing
	36	Statistics – Probability
	37	Trigonometry – Techniques
21 – 30%	25	Graphs – Gradient of curve
	28	Algebra – Vectors
	39	Algebra – Simplifying algebraic fractions

Answers

1	C	21	C
2	C	22	B
3	A	23	A
4	D	24	A
5	B	25	A
6	D	26	B
7	C	27	D
8	D	28	A
9	C	29	C
10	B	30	D
11	C	31	B
12	D	32	B
13	C	33	D
14	B	34	B
15	A	35	C
16	D	36	B
17	C	37	D
18	D	38	A
19	D	39	B
20	B	40	D

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