

# **Foundations of Advanced Mathematics (MEI)**

INTERMEDIATE FSMQ 6989

## **Combined Mark Scheme And Report on the Unit**

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**January 2007**

**6989/MS/R/07J**

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All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the Report on the Examination.

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**Chief Examiner's Report  
FSMQ 6989**

There were 700 candidates this session. The mean was slightly down on previous years. There were 3 questions for which at least one candidate did not offer a response. In every question each of the responses was offered by at least one candidate.

It is not the intention to "catch out" the candidates but rather to create alternative responses that might be chosen by a candidate making a typical mistake. A question that works well, therefore, is one in which the correct response is chosen by 60% - 80% of candidates with an equal proportion of other candidates choosing the other responses. When this does not happen it may be that the alternative answers offered are too obviously incorrect (resulting in a very high proportion choosing the correct response) or that there is a widespread misunderstanding of the topic, or that the question is too hard (resulting in a low proportion choosing the correct response).

In this session for question 3, 90% chose the correct response. In this question on arithmetic the response C with the false answer may have been a little hard, but the other 3 responses were rather too obviously correct.

In this session there were 4 questions where a higher proportion of candidates chose the incorrect response than those choosing the correct response.

Question 20 30% chose correctly response D and 31% chose response C. In this question, on probability, the response C was the probability that the scores were first 6 and then 1 rather than one of each. This is a typical question where a standard error is made in the calculation leading to the decision that an incorrect response is in fact correct. It may well be that a candidate who decides that response C gives the false answer will not check response D. A candidate who does check response D may well then decide that two of the answers are false and so alert him to an error which he may then be able to put right. The message here is that candidates should be encouraged to check all responses and not to stop when they find one that they believe to be the correct response. A comment was made in the June 2006 report that in all cases where more candidates offered the incorrect response than those offering the correct response, the incorrect response came before the correct response. This was not the case this time, and the fact that there were fewer such questions might indicate that note had been made of the comment.

Question 27 30% chose correctly response B; 31% chose response C and 27% response A. It may be that in this question, on vectors, candidates were unfamiliar with the topic and the associated vocabulary.

Question 29 37% chose correctly response A and 41% chose response C. This was a straightforward question on algebra in which the units of money were muddled.

Question 34 19% correctly chose response C; 30% chose response A and 38% response B. This was another probability question with the same topic of two events being either way round, this time with a finite population. Choosing one then the other is 0.244; choosing one of each but in either order is 0.489. Correcting to 2 decimal places then gives 0.49 which was response C. Consequently it is reasonable to assume that once again candidates made the simple error of not doubling their answer, seeing their result as response A and not checking the other responses. Those choosing response B we must assume failed to correct their decimal answer correctly.

Two other questions came close to this situation.

Question 18 38% chose correctly response D and 36% chose response A.

*Mark Scheme and Report on the Unit taken in January 2007*

Question 40 28% chose correctly response D; 25% chose response A, 21% response B and 26% response C.

As in previous reports, the following gives an analysis of candidates choosing the correct response for each question.

Percentage	Question	Topic
81 - 90	3	Arithmetic
	5	Statistics of a small data set
	6	Arithmetic
	11	Algebra - solution of equations
	12	Arithmetic - ratio and proportion
71 - 80	4	Algebra - powers
	13	Arithmetic - standard form
	14	Algebra - expansion of brackets
	32	Arithmetic - areas and lengths on maps
	36	Algebra - quadratic sequence
61 - 70	1	Arithmetic - conversion of metric units
	2	Arithmetic
	8	Data display - pie charts
	19	Algebra - factorisation of quadratic expressions
	22	Algebra - inequalities
	24	Statistics - cumulative frequency curve
	26	Mensuration - surface areas and volumes of similar cuboids
	28	Arithmetic - interpretation of ratio graphs
39	Arithmetic - distance/time graph	
51 - 60	7	Algebra - substitution of values into expressions
	9	Coordinate geometry - equations of straight lines
	10	Arithmetic - reasonable units
	15	Algebra - interpretation of graph
	16	Vectors
	31	Algebra - changing the subject of formulae
	33	Algebra - solution of simultaneous equations
41 - 50	17	Trigonometry - sine and cosine rules
	21	Arithmetic - upper and lower bounds
	23	Algebra - solution of quadratic equations
	25	Trigonometry - graphs of the circular functions
	35	Arithmetic and trigonometry - mensuration of a cuboid
	37	Algebra - interpretation of roots of cubic equations from graphs
31 - 40	18	Coordinate geometry - Pythagoras
	29	Algebra - creation of expressions
	30	Trigonometry - sine and cosine rules
	38	Algebra - simplification of expression involving algebraic fractions
21 - 30	20	Probability
	27	Vectors
	40	Algebra - volume of compound solid
11 - 20	34	Probability

*Mark Scheme and Report on the Unit taken in January 2007*

**Answers**

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

**FSMQ Intermediate Foundations of Advanced Mathematics(FAM)**

**January 2007 Assessment Series**

**Unit Threshold Marks**

<b>Unit</b>	<b>Maximum Mark</b>	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>U</b>
<b>6989</b>	40	30	26	22	18	15	0

The cumulative percentage of candidates awarded each grade was as follows:

	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>	<b>E</b>	<b>U</b>	<b>Total Number of Candidates</b>
<b>6989</b>	18.1	37.0	58.0	76.9	88.4	100	700

Statistics are correct at the time of publication







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