Version : 1.0: 0606

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Mathematics 3302
Specification B

Module 1 Tier I 33001I

Mark Scheme

2006 examination - March series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

The following abbreviations are used on the mark scheme:

M	Method marks awarded for a correct method.
A	Accuracy marks awarded when following on from a correct method. It is not necessary always to see the method. This can be implied.
B	Marks awarded independent of method.
M dep	A method mark which is dependent on a previous method mark being awarded.
ft	Follow through marks. Marks awarded for correct working following a mistake in an earlier step.
SC	Special Case. Marks awarded for a common misinterpretation which has some mathematical worth.
oe	Or equivalent.
eeoo	Each error or omission.

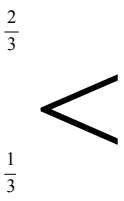
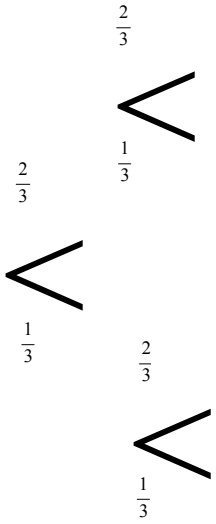
MODULE 1 INTERMEDIATE TIER 33001I

Note: Probability - Accept fraction, decimal or percentage. Do not accept ratio.
1 out of 3 or 1 in 3 penalise once on whole paper.

1(a)	1 – (0.7 + 0.02)	M1	For misread must see working "1–" can be implied from ans
	0.28	A1	
1(b)	0.02 × 1200	M1	Misread must see working
	24	A1	Incorrect further working deduct 1

2(a)	0 × 3 (+) 1 × 12 (+) 2 × 21 + ...	M1	At least 3 correct products seen eg 0 (+) 12 (+) 42 + ... or 12 (+) 42 (+) 72 etc
	= 168	A1	
2(b)	their 'sensible' (a) ÷ 70	M1	(a) from adding at least 3 products
	= 2.4	A1	2 alone scores 0 but correct working seen with 2 on ans line ⇒ M1A0

3(a)(i)	$\frac{2}{5}$ ignore 2 if seen as well	B1	oe 0.4, 40%
3(a)(ii)	$\frac{5}{10}$ ignore 5 if seen as well	B1	oe 0.5, 50%
3(b)	These results support Ronnie's claim because $\frac{11}{20}$ is greater than 50%	B1	or $\frac{11}{20}$ He pots more than he misses Pots more than 50% ($\frac{1}{2}$)
3(c)	Strong positive box ticked	B1	
3(d)	Danger of extrapolation	B1	Also accept Ronnie may be tired after practising for 4.5 hours or that Ronnie cannot win more than 8 games in a match ie the idea that the relationship will change

4(a)	Sight of $\frac{10}{30}$	B1	oe anywhere in (a)
	Any pair of branches with $\frac{2}{3}$ and $\frac{1}{3}$	M1	 0.33, (0.66, 0.67 or better) Accept $\left.\begin{matrix}0.66\\0.34\end{matrix}\right\}$ for M marks
	All 6 'correct' $\frac{1}{3}$ and $\frac{2}{3}$ probabilities on tree (ignore snow labels at this stage so one or more probabilities $\frac{1}{3}$ and $\frac{2}{3}$ could be interchanged)	M1	
	Fully correct including all "Snow" and "No snow" labels	A1	Check the labels to probs are correct
4(b)	One correct product $\frac{2}{3} \times \frac{1}{3}$ (or $\frac{2}{9}$)	M1	ft unambiguous probabilities (pairs of probs must sum to 1)
	Adding both correct products $\left(\frac{2}{3}\times\frac{1}{3}\right) + \left(\frac{1}{3}\times\frac{2}{3}\right)$	M1 dep	ft unambiguous probabilities (pairs of probs must sum to 1)
	$= \frac{4}{9}$	A1	Watch for $\frac{2}{3} \times \frac{2}{3} = \frac{4}{9} \Rightarrow$ M0A0 $\frac{4}{9}$ with no working = SC1

5(a)					**Dice**					
			1	**2**	**3**	**4**	**5**	**6**		
	Coin	**Heads**	2	3	4	**5**	6	7	B1	
		Tails	**–1**	0	1	2	3	4	B1	

5(b)(i)	$\frac{1}{12}$	B1 ft	ft from a completed table or correct ft may be cancelled eg $(\frac{6}{12}) = \frac{1}{2}$
5(b)(ii)	$\frac{5}{12}$	B2 ft	ft from a completed table or correct ft may be cancelled eg $(\frac{6}{12}) = \frac{1}{2}$
			Allow B1 for numerator 5 of any fraction < 1

6(a)	Both linear horizontal and vertical scales seen	B1	Condone 0's missing (At least 2 values on each scale) Allow ≤10, ≤20, ≤30, ≤40
	Equal class widths for 'histogram' (no gaps) or plotting at correct midpoints. Dependent on using a linear horizontal scale seen eg $0<t\leq10$, $10<t\leq20$ etc for frequency polygon	B1	All four
	Correct heights for 'histogram' or their midpoints joined by "straight" lines for frequency polygon	B1	Their bars or midpoints must be clearly within the class interval $0<t\leq10$ etc $\pm\frac{1}{2}$ sq SC2 Perfect with either no horizontal scale or $0<t\leq10$ or wrong scale
6(b)	22 + 3 or 25 seen	M1	
	$\frac{(22+3)}{100} \times 800$	M1	25% (or $\frac{1}{4}$) × 800
	= 200	A1	SC1 for any correct individual calc eg $\frac{22}{100} \times 800 = 176$ or $22 \times 8 = 176$ or $3 \times 8 = 24$ etc even if $\frac{40}{100} \times 800$ is included 176 or 24 seen ⇒ SC1

7(a)(i)	Leading	B1	Accept biased, unfair or suggestive
7(a)(ii)	Biased because she has only delivered it to the houses on her street	B1	Restricted sample. Biased Also accept Sample size too small
7(b)	Suitable question	B1	eg "What do you think is the latest time that under-16s should be indoors?"
	Suitable response section At least 3 tick boxes for times (gaps OK)	B1	eg ☐ before 9 pm ☐ 9-10 pm ☐ 10-11 pm (Condone continuous boundaries overlapping)

8(a)	100 – "their attempt at reading at 25" Allow misread of scale	M1	100 – 88, 84 – 100, 89 – 100, 84, 89 88 – 100 OK
	12	A1	
8(b)	14	B1	Allow a value of 13.5 to 14.5 inclusive
8(c)	Locating and subtracting the quartiles	M1	"19" – "10" (allow $\pm \frac{1}{2}$ square on each reading)
	8 to 10	A1	Depends on correct M mark if seen