

1. Mrs Green wants to find out how often people visit her sports centre. She uses a questionnaire.
 - (a) Design a suitable question for her questionnaire to find out how often people visit her sports centre.
You must include some response boxes.

(2)

The sports centre has 5000 members.
Their ages are from 10 years to 60 years.

The table shows some information about these members.

Age (years)	Number of males	Number of females
10 to 16	1500	1300
17 to 25	600	400
26 to 40	750	200
41 to 60	150	100

Mrs Green takes a sample of 200 of the 5000 members.
Her sample is stratified by both age and gender.

- (b) Calculate the number of males aged from 26 years to 40 years in her sample.

.....

(2)
(Total 4 marks)

- 2. Toby wants to find out how many text messages people send.

He uses this question on a questionnaire.

How many text messages have you sent on your mobile phone?			
0 – 10	10 – 20	20 – 30	30 or more

- (a) Write down **two** things wrong with this question.

1

.....

2

.....

(2)

Toby also wants to find out how much time people spend talking on their mobile phones.

- (b) Design a suitable question Toby could use for his questionnaire.
You must include some response boxes.

(2)
(Total 4 marks)

- 3. Michael wants to find out how much teenagers spend on magazines.

He uses this question on a questionnaire.

How much do you spend on magazines?

£1 to £2	£2 to £3	£3 to £4	over £4

- (a) Write down **two** things that are wrong with this question.

1

.....

2

.....

(2)

- (b) Design a better question Michael can use to find out how much teenagers spend on magazines.
You must include some response boxes.

(2)

The table shows some information about the students at Michael's school.

Year	Number of males	Number of females	Total
Year 10	104	76	180
Year 11	87	93	180
Year 12	60	40	100
Year 13	54	46	100
Total	305	255	560

Michael takes a sample of 100 students.
His sample is stratified by both Year and gender.

- (c) Calculate an estimate for the number of female students from Year 12 in his sample.

.....
(2)
(Total 6 marks)

01. (a) “How many times each month do you visit the sports centre?” 2
Response boxes, for eg.

0 to 4 times
5 to 10 times
Over 10 times

*B1 for reference to a time period; week, month,..
OR a question with time period implied by responses.
B1 for at least 3 non-overlapping numeric boxes
(condone if not exhaustive; include never as 0, but other as not
numeric.)
Do not award any marks for questions that do not have
quantitative response boxes. Do not accept frequency tables, or
data collection sheets.*

- (b) $\frac{750}{5000} \times 200$ 2
= 30

$$M1 \text{ for } \frac{750}{5000} \times 200$$

A1 cao

[4]

02. (a) 2 reasons 2
*B1 overlapping regions
B1 no time frame*

- (b) question 2
*B1 suitable question (about time spent on mobile phones)
with time frame
B1 at least three suitable response boxes, not overlapping*

[4]

03. (a) No time period, overlapping boxes, no under £1 2
B2 (B1 for each criticism)

- (b) “How much do you spend on magazines each week?” 2
Under £1, £1 to £3, over £3

*B1 for including a time period; eg, week, month
B1 for at least 3 correct non-overlapping, adjacent numerical
ranges with at least one extreme indicated*

$$(c) \quad \frac{40}{560} \times 100 = 7$$

2

*MI for $\frac{40}{560} \times 100$ o.e.
or 7.1(42857) or 7.2 seen*

AI cao

$$SC \frac{40}{1120} \times 100 oe = M1A0$$

[6]

- 01.** Candidates in this question had to give their answer more thought, which caused many to provide questions which were unsuitable.

The better answers referred to weekly visits, giving a range of non-overlapping numbers. An acceptable alternative was a set of boxes referring to daily, weekly, monthly, etc. Weaker candidates gave less well-defined boxes, using terms such as “often”, “frequent”, etc., which was inappropriate. Centres also need to be aware that use of inequalities in response boxes is unsuitable for a questionnaire.

In part (b) there were many instances of misreading or transcription error: 5000 read of 500, 200 read as 2000. Candidate need to be more careful when transcribing number for calculation. There were many confused attempts with a mixture of multiplication and division in the wrong order. Systematic sampling remains a major weakness.

- 02.** The majority of candidates scored at least one mark for their answer to this question either citing the need to give a time frame in the question or to avoid overlapping categories for the number of text messages. However, it was not usual for the candidates to give both of these. Many candidates stated the need to have smaller groups or more groups to cover a larger number of text messages, or the need for a box for people with no phone. In part (b) a substantial number of candidates failed to read the question properly and constructed questions relating to the number of text messages rather than the time spent speaking on a mobile phone. Despite having identified overlapping categories or the lack of a time frame as a problem in their answer to part (a), some candidates failed to remedy this in part (b). The misuse of inequality signs was common. Most candidates scored at least one mark for their question.

03. The three things which were wrong with the questionnaire were often recognised correctly as being 'no time period', 'overlaps' and 'no less than £1' of which two had to be stated to obtain the two marks. Generally this part was well answered with very few being unable to score at least one mark. In part (b), the redesign of the question with response boxes proved to be less well handled. Time was usually correctly identified as being an essential part of the question but the response boxes often ignored the overlap, even where this had been stated in the previous part or else they left gaps in their response boxes by providing 1 – 3, 4 – 6, etc. There was a lack of understanding of the correct use of inequalities with $£3 < £4$, $<£2$ to $\leq £3$, $£2 \geq 0 < £3$ and $2 < n \geq 3$ seen. Other attempts restructured the question to say 'which magazines do you buy?' or 'how much do you pay for a magazine?' Around 55% of the candidates were able to score 3 or 4 marks in parts (a) and (b) with just over 6% scoring no marks at all.

In part (c) the calculation ' $40 \times 100 \div 560$ ' was required with a rounding to the nearest whole number. The correct values were much in evidence but the order of the operation was not always convincing with ' $560 \div 40 = 14$ ' appearing. Other solutions used the total of the 'number of females' rather than the grand total in their calculations. Some misreads took place with the grand total of '1120' representing ' 2×560 ' being used thus allowing only for the award of a method mark where it was correctly used. Most candidates could identify that there were 40 students in year 12 but failed to score any marks as they could not then carry on dividing by 560 and multiply by 100. Those that did get to 7.14 sometimes either left the answer as this or rounded to 8, losing the final accuracy mark. Over 64% of the candidates failed to score on this question.