1. 340 475 people live in Brinton.
A company carried out a survey.
It used a random sample of 1500 of the 340 475 people.
870 of this sample of 1500 people were male.

Work out an estimate for the number of **females** living in Brinton.

…….

(Total 3 marks)

2. Melanie wants to find out how often people go to the cinema.

She gives a questionnaire to all the women leaving a cinema.

Her sample is biased.
Give **two** possible reasons why.

1 .....

.....

2 .....

.....

(Total 2 marks)

3. Poppy wants to find out for how much time people use their computer.

She uses this question on a questionnaire.

For how much time do you use your computer?

0–1 hours	☐	3–4 hours	☐
1–2 hours	☐	4–5 hours	☐
2–3 hours	☐	5–6 hours	☐

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

1 .....

.....

2 .....

.....

(2)

Poppy gives her questionnaire to all the students in her class.

Her sample is biased.

(b) Give **one** reason why.

.....

.....

(1)

(Total 3 marks)

01. 143 000 3

1500 – 870 = 630
630/1500 × 340475 = 142999.5

M1 for 1500 – 870 or 630 seen
M1 for "630"/1500 × 340475
A1 for 142999 to 143000
[SC: B2 for 197475 to 197476 with or without working]
Alternative:
If no M's awarded because of premature estimation,
B2 can be awarded for an answer in the range 136000 to 145000
For an answer outside of the range, B1 for
$\frac{1500 - "870"}{1500} \times$ *"340475"*
[SC:B1 for males in the range 195000 to 204000]

[3]

02. 2 reasons 2

B1 eg only women asked or you need to ask men
B1 eg only leaving a cinema or needs to be different places

[2]

03. (a) Overlapping intervals
Time frame
No 6+ (or none) 2

B2 for 2 correct731607245
(B1 for 1 correct)

(b) Not representative of all ages
Students use computers more 1

B1 for one acceptable reason

[3]

01. A large number of candidates failed to fully appreciate the language of estimation in terms of a sampling process and began approximating early in their calculations. Marks were still awarded even so, depending upon the level of approximation. It was pleasing, however to see correct methods being employed by many candidates. Common mistakes were answers of 197476 (males), 630 (1500 – 870) and 339605 (340475 – 870)

02. This question allowed candidates to be creative in their answers and 47% of them seized the opportunity and gained two marks. There were, of course, many candidates who had good ideas and were able to write them intelligibly. They were able to point out that having only women in a sample would make it biased (Many wrote that men and women may well have different cinema going habits). They were also able to remark on the fact that the people interviewed leaving the cinema must already have been to the cinema at least once. 90% of all candidates were able to score at least 1 mark, usually for identifying that only women were asked, they found it harder to identify that the location was important as well.

03. In part (a), most candidates were able to score at least one mark in this question, usually for identifying the overlapping intervals. Another popular response was to identify in some way that there was not a box for more than 6 hours, e.g. “no other box”, or a box for no computer, e.g. “they may not have a computer”. A small number of candidates thought, incorrectly, that there was a problem with the grammar of the question, or with the presentation of the boxes.

In part (b), about a third of the candidates were able to identify why her sample was biased. Many simply repeated one of the reasons they gave in part (a), typically ‘they may not have a computer’, or where too, e.g. ‘she only asked the people in her class.”