

## Mark schemes

### Q1.

**[AO2 = 3]**

Award marks as follows:

**1 mark** for a suggestion of an appropriate variable, eg difficulty of the mathematical problems, quality of the sleep gained, environmental conditions (eg room temperature, other distractions in the room etc), boredom/fatigue/practice.

Accept other appropriate suggestions.

**1 mark** for an explanation of why it should be controlled, eg if the mathematical problems in one condition were easier than those in the other condition then participants would record a quicker time due to the relative difficulty of the mathematical problems and not the amount of sleep they got.

**1 mark** for a practical description of how it could be controlled, eg the researcher would need to standardise the 20 mathematical problems to ensure they are of similar difficulty and then allocate 10 to each condition.

**Note:** these three marks should match so that the variable that has been identified is then explained and dealt with providing a coherent response.

**[3]**

### Q2.

(a) **[AO1 = 1 AO2 = 1]**

#### **Outline content**

**1 mark** for an outline of standardisation – ways in which procedures/materials/instructions within an investigation are kept the same for all participants.

Accept alternative wording.

#### **Possible application:**

**1 mark** for one way in which standardisation could have been used in this experiment.

#### **Possible ways:**

- the same word list for both groups/conditions
- the same order of words for all participants
- the same instructions for all participants **in the same group**
- the same timings for all participants **in the same group**
- the same room for each condition
- the same book for all participants in **Group B**.

Accept other valid ways.

2

(b) **[AO1 = 1 AO2 = 1]**

### Outline content

**1 mark** for an outline of randomisation – the use of ‘chance’ in setting up the investigation.

### Possible application

**1 mark** for one way in which randomisation could have been used in this experiment.

#### Possible ways:

- the order of words in the list should have been decided randomly
- the allocation of participants to each condition/group should have been decided randomly.

Accept other valid ways.

2

[4]

### Q3.

(a) [AO2 = 2]

**2 marks** for a clear explanation of why it was important to match the students for this variable.

**1 mark** for a limited or muddled explanation, or for an answer without application.

#### Content:

- level of interest could affect their satisfaction scores so needs to be controlled; matching students’ levels of interest in business studies keeps this participant variable constant.

2

(b) [AO2 = 2]

**1 mark** for a suggestion of an appropriate variable – interest in using computers (e.g., for studying), past experience of using computers (e.g., for studying), disability issues, prior knowledge of this business studies topic.

Accept other appropriate suggestions.

**1 mark** for an explanation of how it might relate to satisfaction scores.

2

(c) [AO2 = 2]

**2 marks** for a clear outline of one benefit of random allocation in this situation.

**1 mark** for a limited or muddled explanation, or for an answer without application.

#### Relevant points:

- removal of researcher bias in determining which participant has the most to least number of online hours
- increased validity as the researcher will not be biased in how students are allocated
- removal of participant bias as each participant has the same chance of having a particular number of online hours as any other participant.

2

(d) **[AO3 = 3]**

**3 marks** for a clear and coherent explanation of how stratified sampling would improve the design.

**2 marks** for some explanation of how stratified sampling would improve the design.

**1 mark** for a muddled / limited explanation.

**Content:**

- stratified sampling ensures each identified sub group of the whole target population of possible participants is represented in the sample so generalisation of the results to the target population is more valid than if the participants were just available at the time of asking
- stratified sampling is an improvement because people who are identified by opportunity are likely to be present at same time, doing similar things, possibly of similar personality types etc which may limit representativeness of sample.

Accept other appropriate explanation points.

3

(e) **[AO2 = 1]**

**1 mark** for a question which would generate qualitative data: what did you like / dislike about the online / classroom lessons?

Accept any appropriate question or item that generates qualitative data.

1

(f) **[AO2 = 2]**

**2 marks** for a clear and coherent explanation of a possible problem.

**1 mark** for a muddled / limited explanation.

**Possible problems:**

- analysis of qualitative data relies on interpretation by the researcher which could be inaccurate / biased / subjective
- qualitative data may not be easy to categorise / collate into a sensible number of answer types
- the researcher could be left with lots of individual responses that cannot be summarised.

Do not accept answers which simply identify a problem with no further appropriate elaboration e.g. 'hard to analyse', 'time consuming'.

2

(g) [AO2 = 1]

**1 mark** for an outline of an appropriate ethical issue that would be relevant when using a questionnaire: issues such as anonymity, protection from harm, treating with respect, parental consent.

**Possible issues:**

- the students should be treated with respect by explaining that their answers will be kept confidential
- the students must be assured that they can withdraw their answers if they want to
- the students must be told exactly what the researcher was trying to find out about the relationship between satisfaction and the way information was delivered.

Answer must be an outline and not just a name or term.

1

(h) [AO2 = 4]

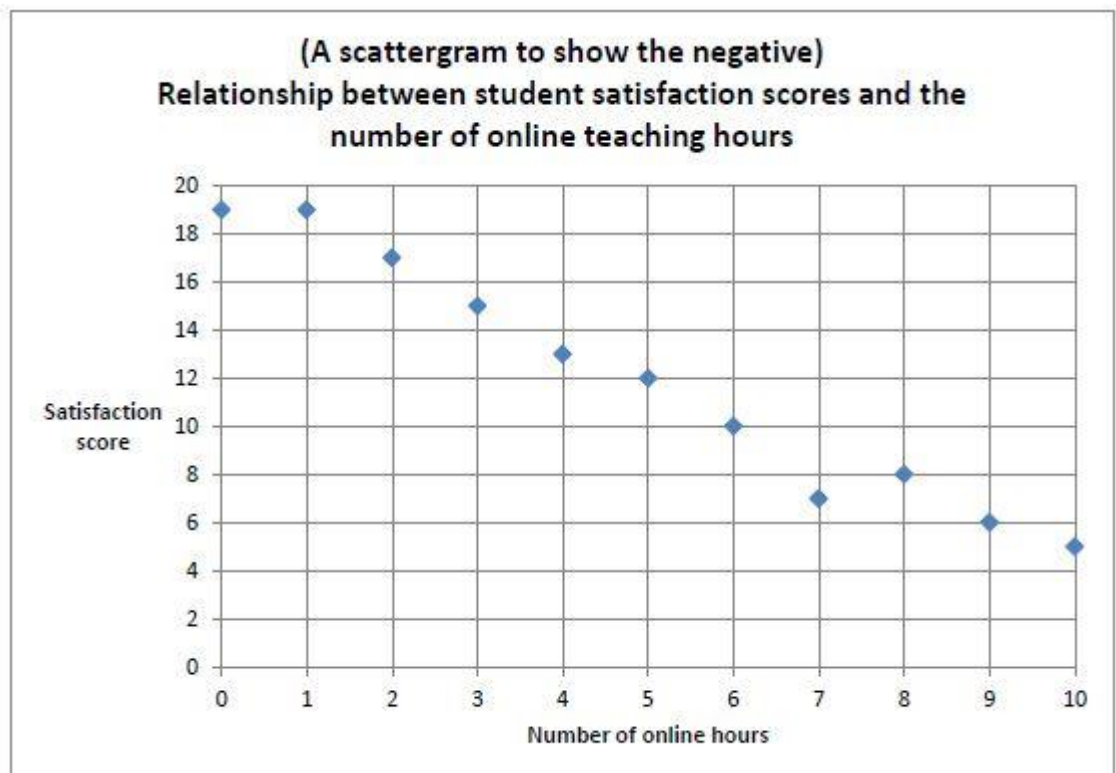
Award **1 mark** for each of the following points.

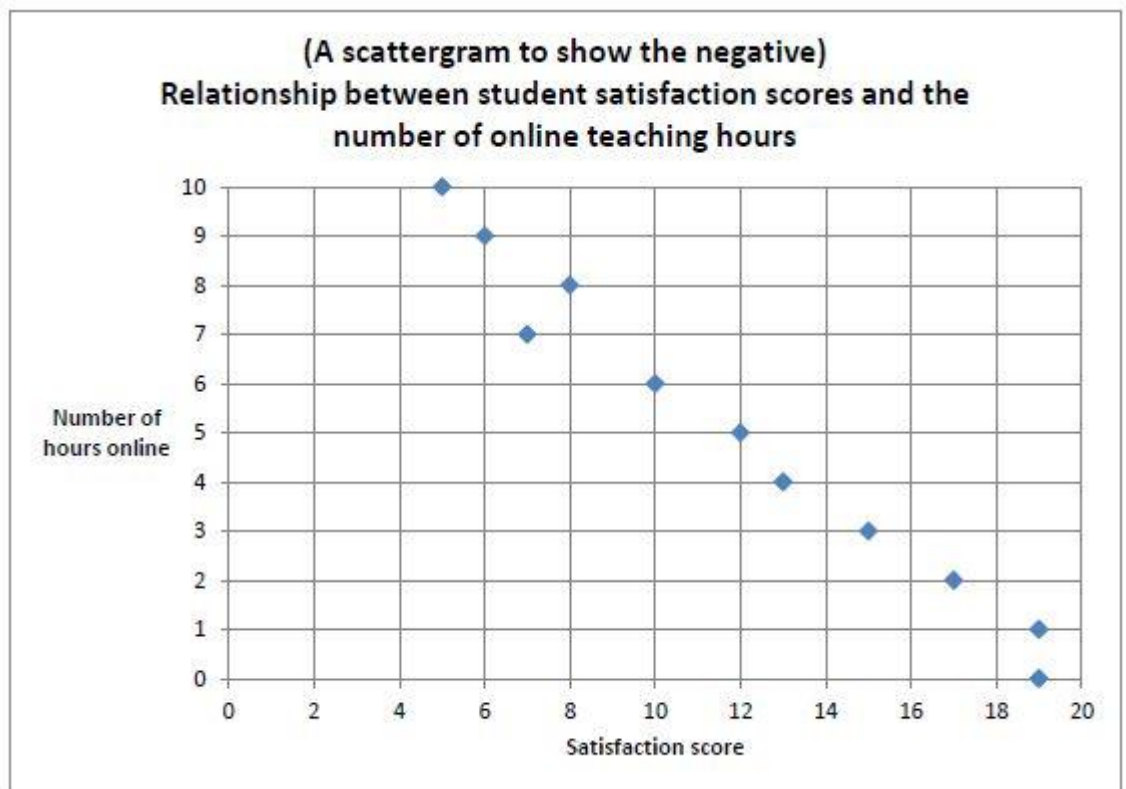
**Content:**

- appropriate title, including reference to (negative) relationship and the two variables
- axis 1 – number of online hours and suitable scale 0-10
- axis 2 – satisfaction score and suitable scale 0-20
- accurate plotting of 11 points on scattergram.

No penalty for drawing a line of best fit.

If display is not a scattergram award max 1 mark if title is appropriate.





4

(i) [AO2 = 2]

**1 mark** for saying there is a negative relationship / correlation (between the number of online hours and satisfaction scores).

**1 mark** for further detail e.g. the **more** hours they have online the **less** they are satisfied with the course (or vice versa), however this does not indicate a cause and effect relationship.

Accept other valid conclusions.

2

(j) [AO2 = 2]

**1 mark** for the mode = 19

**1 mark** for the median = 12

2

(k) [AO2 = 2]

**2 marks** for a clear and coherent explanation.

**1 mark** for a muddled or limited explanation.

- The median is more representative than the mode because the mode is at the top end of the set of scores, whereas more of the scores are numerically closer to the median.

Accept other explanations, for example, in terms suitability in relation to ordinal data vs nominal data.

2

(l) [AO1 = 1] **1 mark** for B