CHAPTER TEST ANSWERS

Chapter 2 Approaches to problem-solving methodology: data analysis

Section A

Multiple-choice questions

1 In a database or spreadsheet, a macro is used to:

C automate complex tasks.

2 Graphic solutions are useful because they:

D clearly show patterns in data.

3 A suitable way to show changes over time is:

A a column chart.

4 An infographic often succeeds when it is:

B engaging.

5 Proportion can be employed by:

C making important information larger than less important information.

6 You can use the design principle contrast by:

A applying very different colours to text and backgrounds.

7 When using other people's intellectual property in your graphic solution, you should:

C cite using a reference style such as Harvard, APA, Chicago or IEEE.

8 A convention is:

B the standard, accepted way of doing things.

9 You could improve the accessibility of your graphic solution by:

C choosing a body text size that is readable by many people.

10 With an IPO chart, you can:

C design formulas.

11 If you needed to design the appearance of a webpage you could use:

A a mock-up.

12 Validation checks that:

B data is reasonable.

13 During the testing of an infographic, a user points to a section of the infographic and asks, 'What on earth does this have to do with the topic?' You would conclude that this section is:

D irrelevant.

14 If a manager complained that a graphic solution is ineffective, it might be because it:

C is inaccurate.

15 A researcher chooses to present data in a table. The researcher is using:

A a format.

Section B

Short-answer questions

1 James, a researcher into student health, conducts interviews to determine if the amount of sleep students get affects their mood or wellbeing. The data is as follows.

Sleep (hours)	Average mood 1 = Worst mood to 5 = Happiest mood
<5	2
5–6	3
7–8	4
8–9	5
>9	3

Choose an appropriate graphic format to make the meaning of this data clear to readers. Use conventions that are appropriate to the chosen format and annotate the graphic to indicate the conventions that have been used, and where.

Answer: Responses will vary.

2 List five reasons for using software rather than pen and paper to create a graphic solution to represent data.

Answer: Accept any five reasonable responses, each worth 1 mark.

- It is easier to add colour electronically.
- It is easier to edit and correct electronically.
- Calculations can be made with precision and can be automated with formulas.
- The same data can be presented in many different ways.
- Data can be validated electronically.
- The solution can be saved and distributed easily.
- If hard copies are required, multiple copies can be obtained quickly and easily
- The solution can be exported to different formats such as spreadsheets, images or pdfs.

3 Alice gathers data about how students feel about their teachers. She asks several questions, and students answer using a standard scale for answers from zero (not at all, or never) to 10 (completely, or all the time).

a Suggest three methods Alice could use to validate the data.

Answer:

- Check that the answers are in the range of 0 and 10 (1 mark).
- Check the data type to ensure they are numeric (1 mark).
- Check that answers are given to all questions (1 mark).

b From the data, Alice creates an infographic. Suggest two methods she could use to test the effectiveness of the infographic.

Answer: Show the product to typical end-users and ask them questions about its meaning and quality (1 mark).

Manually re-calculate the results in the graphic to verify they are accurate (1 mark).

4 a List the four stages of the problem-solving methodology (PSM) and explain the main purpose of each one.

Answer:

i Analysis stage (½ mark): To understand the problem, identify constraints and requirements and define the scope of the solution (½ mark)

ii Design stage (½ mark): To create the solution design and specify evaluation criteria (½ mark)

iii Development stage (½ mark): To manipulate or code the solution, to validate input data and test the solution, and write documentation to train users (½ mark)

iv Evaluation stage (½ mark): To decide on an evaluation strategy and then to report on the success of the solution (½ mark)

b Identify and explain one main benefit of using the PSM.

Answer: Responses will vary, but the following is an indicative sample response. Using the PSM ensures that the major steps of the project have been properly considered and carried out.

5 James, still researching student health, gathers more data about student daily activity.

He summarises data from many interviews and discovers that, on average, students spend their days as follows.

Activity	Time spent (hours)
Sleeping	9
School	7
Recreation (sport)	6
Paid work or homework	2

Create a suitable graphic solution to show this data, using appropriate formats and conventions. Annotate the graphic to indicate where you have applied formats and conventions.

Answer: Responses will vary, but a pie chart would be an expected solution. A pie chart needs to have a title, with the largest slice beginning at the 12 o'clock position with progressively smaller slices following and proceeding clockwise. Expect to see colour or shading to distinguish slices and slices should be labelled. The percentage contributed by each slice may be given in the slice or in a legend, but not both. Raw values may be given, but percentages are preferred. Students should not give both raw and relative values.