# Topic Test 4 – Descriptive statistics

# Trainer & Assessor Marking Guide

## Criteria

### Unit code, name and release number

MSL924003 - Process and interpret data Release 1

\*\*This unit sits in all qualifications below. This assessment is not to be amended\*\*

### Qualification/Course code, name and release number

MSL60118 Advanced Diploma of Laboratory Operations Release 1

MSL50118 Diploma of Laboratory Technology Release 1

MSL40118 Certificate IV in Laboratory Operations Release 1

MSL30118 Certificate III in Laboratory Skills Release 1

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For queries, please contact:

*Innovative Manufacturing, Robotics and Science Skills Point*

*TAFE Hamilton Campus*

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This assessment can be found in the: [Learning Bank](https://share.tafensw.edu.au/share/access/searching.do?doc=%3Cxml%2F%3E&in=P7ac4831b-430a-4b8d-8b56-f7b32ed5b9cf&q=&type=standard&sort=rank&dr=AFTER)

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## Assessment instructions

Table 1 Assessment instructions

| Assessment details | Instructions |
| --- | --- |
| **Instructions for the trainer and assessor** | This is a written assessment and will be assessing the student on their knowledge of the unit.  This assessment has 7 questions. It is to be conducted as a supervised open book test. Students are able to bring the Student Workbook into the test but no other information resources.  Model answers, sample responses or a criteria for each question are provided below.  Use these to support your judgement when determining a satisfactory result.  The student’s response to each question must contain the information indicated in this marking guide in order for their response to be correct. However, if a student provides information other than indicated below, and in the professional opinion of the assessor it is appropriate and meets the intent of the question, it may be considered correct.  The assessment feedback page must be signed by both the student and the assessor so the student displays that they have received, understood and accepted the feedback.  Arrange a time for each student to view their marked tests and the assessor feedback. Assessors are to retain all tests after students have viewed their results. Students to not keep a copy of their completed test.  Ensure the students name appears on the bottom of each page of the submitted assessment. |
| **About this marking guide** | The student’s response to each question must contain the information indicated in this marking guide in order for their response to be correct.  All questions must be answered correctly in order to satisfactorily complete this assessment event.  Assessors will need to make a judgement call as to whether each answer/response meets the criteria based upon the:   * Rules of Evidence:   + Validity – does the answer address the assessment question and does the evidence reflect the four dimensions of competency?   + Sufficiency – is the answer sufficient in terms of length and depth?   + Currency – has the work been done so recently as to be current?   + Authenticity – is this work the student’s own authentic work? * Principles of Assessment:   + Fairness – individual student’s needs are considered in the assessment process   + Flexibility – assessment is flexible to the individual student   + Validity – any assessment decision is justified, based on the evidence of performance of the student   + Reliability – evidence presented for assessment is consistently interpreted and assessment results are comparable irrespective of the assessor conducting the assessment * Dimensions of competency   + Task skills   + Task Management Skills   + Contingency Planning Skills   + Job Role Environment Skills |
| **Student must provide** | Students must provide pen/s, calculator, ruler/straight edge and their Student Workbook. |
| **Assessor must provide** | One copy of the assessment task per student, filename MSL924003\_AE\_Kn\_4of7. |
| **Time allowed** | 1 hour |

## Short answer

1. Provide a definition of *descriptive statistics*.

Static calculated stats that are not inferring.

1. Describe the difference between a *sample*, a *population* and a *census*.

Sample is a subset of a population. If the population is analysed, then it is a census.

Any response that is the same in meaning as the “Samples and populations” section in Topic 5 of the Student Workbook.

1. a) What does the term *representative* mean? Why do samples need to be representative?

The term ‘representative’ means ‘is the same as’.

b) Why do samples need to be representative?

If the sample is not representative of the population, any data you get is wrong.

Students need to provide an answer similar in meaning to the above.

1. a) What is the difference between a *distribution of data* and its *central tendency*?

Students need to provide an answer consistent with the two relevant sections of the Student Workbook – Topic 5 section *What is ‘a distribution of data’* and *What is ‘central tendency’ of data*. An example would be:

The distribution of data shows the shape or pattern of the data set and how it is spread across the range and around the central tendency. The central tendency is a single numeric measure which expresses the middle or most common value of the data set such as mean, median or mode.

b) Identify one key statistical measure for each term.

Distribution: standard deviation

Central tendency: mean, mode, median

1. What is the difference between a *normal* and *non-normal* distribution?

Students need to provide an answer consistent with the two relevant sections of the Student Workbook – Topic 5 section *The ‘Normal’ distribution* and *Non-normal distributions.* An example would be:

In a normal distribution the mean, mode and median are equal and at the centre of the curve. The frequencies spread out in a predictable way based on standard deviations. There are many other distributions which do not fit the normal shape, these are all non-normal distributions (for example, bimodal, exponential, skewed).

1. Examine the following data set containing the temperature data from an incubating oven.

Table 2 Data set containing temperature data from an incubating oven

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 37.2 | 37.2 | 38.0 | 35.8 | 36.5 | 37.9 | 35.5 | 36.8 | 35.2 | 38.0 |
| 38.1 | 35.6 | 38.3 | 36.7 | 35.4 | 36.8 | 35.7 | 36.4 | 37.5 | 35.3 |
| 36.9 | 36.5 | 36.8 | 37.6 | 35.8 | 35.4 | 38.4 | 36.4 | 36.7 | 38.8 |

* 1. Complete the following tally chart and graph frequency histogram. You will need to decide on an appropriate bin range

An example of a suitable response is provided below. Students might select different bin sizes. This is entirely acceptable provided that the bin sizes are all the same size and that there are no value gaps in between each bin. If students have different bin sizes to those in the example below the graph will look different. Ensure that the bin sizes, distribution and graph are all consistent with the data set above.

Table 3 Tally chart to be completed

|  |  |  |
| --- | --- | --- |
| **Bin** | **Tally**  **(score)** | **Frequency**  **(tally sum)** |
| **Example>>>** | ~~||||~~ ||| | 8 |
| **34.0-34.9** | II | 2 |
| **35.0-35.9** | ~~IIII~~ I | 6 |
| **36.0-36.9** | ~~IIII~~ ~~IIII I~~ | 11 |
| **37.0-37.9** | IIII | 4 |
| **38.0-38.9** | ~~IIII~~ | 5 |
| **39.0-39.9** | II | 2 |

* 1. Graph the data from the table above to create the histogram in the empty grid to follow;

The graph must align with the bins the student has choses and have a title and axis labels.

1. Calculate the following attributes of the data set from Question 6. You can use a calculator (physical or online) or a spreadsheet to find the answers. You do not need to show your working.
   1. Minimum value

34.2

* 1. Maximum value

39.4

* 1. Range

5.2

* 1. Mean

36.8

* 1. Mode

36.8

* 1. Median

36.7

1. Standard deviation of the following sample of data from Question 6

|  |  |
| --- | --- |
| 37.2 | 37.2 |
| 38.1 | 35.6 |
| 36.9 | 36.5 |

0.833