Skills for Computing

SAMPLE TIME CONSTRAINED ASSESSMENT

MARKING SCHEME

This marking scheme has been prepared as a **guide only** to markers. This is not a set of model answers, or the exclusive answers to the questions, and there will frequently be alternative responses which will provide a valid answer. Markers are advised that, unless a question specifies that an answer be provided in a particular form, then an answer that is correct (factually or in practical terms) **must** be given the available marks.

If there is doubt as to the correctness of an answer, the relevant NCC Education materials should be the first authority.

Throughout the marking, please credit any valid alternative point.

Where markers award half marks in any part of a question, they should ensure that the total mark recorded for the question is rounded up to a whole mark.

Answer ALL questions

Question 1

The total of all sales in a shop to the nearest $50 for the days Monday to Saturday are shown.

Day	Sales ($)
Monday	300
Tuesday	250
Wednesday	400
Thursday	500
Friday	450
Saturday	600

a) Draw a bar chart to represent the data in the table. **6**

Mark scheme
1 mark per bullet
• Title
• X axis days of week, appropriate scale and title
• Y axis sales, appropriate scale and title
• 2 correct bars per mark to max 3

b) Calculate the average amount taken over each day to 2dp. Show your working. **2**

Mark scheme
1 mark per bullet
• Working e.g. (300+250+400+500+450+600)/6
• 416.67

c) Calculate the percentage of week's sales that were taken on the Saturday. Show your working. **2**

Mark scheme
1 mark per bullet
• working e.g. 600/(300+250+400+500+450+600)
• 24%

Total 10 Marks

Question 2

a) Explain the difference between primary and secondary data. **2**

Mark scheme
1 mark per bullet
• Primary is gathered direct from the source
• Secondary was already collected by someone else or pre-existing data

Marks

b) Two errors that can occur when collecting and recording data are a rounding error and a transfer error.

i) What is a rounding error? **1**

Mark scheme
1 mark e.g. a number is changed to fit the required number of digits

ii) What is a transfer error? **1**

Mark scheme
1 mark e.g. the number is recorded inaccurately

iii) Describe **one** additional type of error. **2**

Mark scheme
1 mark per name, 1 for description (award if in context)
e.g. bias (1) the data gathered does not cover the whole range (1)
systemic (1) data can be gathered that is not possible (1)

c) Data about students marks in a test, produce a normal distribution.

i) Describe what is meant by a normal distribution using marks in a test as an example. **3**

Mark scheme
1 mark per point to 2 for description e.g.
• Data is most populous in the centre
• There is less data in the extremes/tails
• An appropriate graph

1 mark for description e.g. most learners will gain marks in the middle range, fewer getting a small number, or high number of marks.

ii) What would it mean if the marks gave a uniform distribution? **1**

Mark scheme
1 mark e.g. the number of learners getting each mark would be the same

Total 10 Marks

Marks

Question 3

The shop compares the amount taken over two weeks. The table shows the results.

Day	Week 1 Sales ($)	Week 2 Sales ($)
Monday	300	150
Tuesday	250	200
Wednesday	400	450
Thursday	500	100
Friday	450	550
Saturday	600	720

a) Rank the results and calculate the Spearman rank correlation coefficient for this data. Give your answer to two decimal places. **8**

Mark scheme

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 1	300	250	400	500	450	600
Week 2	150	200	450	100	550	720
Rank (x)	5	6	4	2	3	1
Rank (y)	5	4	3	6	2	1
d = rank x - rank y	0	2	1	-4	1	0
d^2	0	4	1	16	1	0

$\sum$d^2 =22
r= 1-(6$\sum$d^2)/n(n^2-1)
r=1- (6×22)/6(6^2-1)
r=1- 132/210
r=1- 0.6286
r= 0.37 (to 2 d.p.)

1 mark per bullet
- **Rank of x**
- **Rank of y**
- **Calculation of d row**
- **Calculation of d2 row**
- **Calculation of $\sum$d^2**
- **Correct calculation of r**
- **Correct r result**

Result to 2dp

Marks

b) Comment on your result to part a) **2**

Mark scheme
1 mark per bullet
• Moderate
• Positive

Total 10 Marks

Question 4

The shop wants to expand to sell different products. The managers need to decide on the products they want to introduce.

a) Describe right-brained thinking **and** how it can be used to help make this decision. **3**

Mark scheme
1 mark for definition e.g. creative
1 mark each e.g.
• Use brain storming/mind mapping/blue sky thinking
• To come up with new ideas on what to sell

b) Describe left-brained thinking and how it can be used to help make this decision. **3**

Mark scheme
1 mark for definition e.g. logical
1 mark each e.g.
• Use critical thinking
• To make decisions based on facts on what to sell / to raise questions about the facts/products to sell/ e.g. using current sales data

c) Explain how the following TASC cycle phases can be used by the managers to help make this decision.

i) Gather / organise **2**

Mark scheme
1 mark for each applied point e.g.
• Use to gather/organise information about the current products
• Use to gather/organise information about possible future products

ii) Evaluate **2**

Mark scheme
1 mark for each applied point e.g.
• Analyse the results from the implementation
• Identify the benefits gained
• Identify any problems.

Total 10 marks

Marks

Question 5

a) Why is it important to engage in life-long learning? **1**

Mark scheme
1 mark per bullet
• To continually improve one's self/knowledge

b) A student produces a piece of research but does not include references.

i) Explain why the student needs to include references. Give THREE (3) points for full marks. **3**

Mark scheme
1 mark each e.g.
• They could be accused of plagiarism
• Readers will not know where their ideas came from
• The facts cannot be checked
• Readers will not know where to find more information

ii) Describe what is meant by speed reading. **2**

Mark scheme
1 mark per bullet to 2
• Do not read all the information
• Read the headings/subheadings
• Read the introduction
• Read the conclusion

c) Give an example of positive feedback **and** one example of constructive you have received about your studies and explain how you acted upon it. Both examples need to be different. **4**

Positive:
1 mark for identification e.g. improved note taking
1 mark for action e.g. continued to use the same method

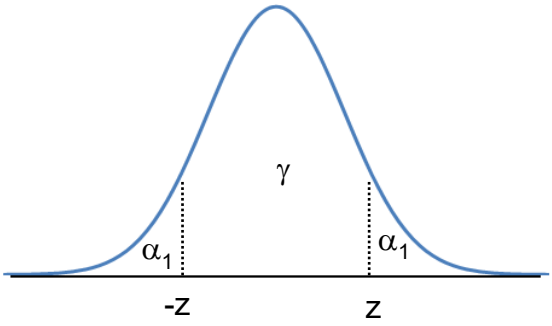
Constructive
1 mark for specific example e.g. told how referencing correctly will improve work. Do not award just negative e.g. told was not good at referencing. Must be constructive
1 mark for action e.g. I checked that my next piece of work was correctly referenced

Total 10 Marks

End of paper

Formula sheet

1. Percentage points of the normal distribution



□1	15.87%	15%	5.00%	2.50%	2.28%	1.00%	0.50%
□	68.27%	70.00%	90.00%	95.00%	95.45%	98.00%	99.00%
z	1.0000	1.0364	1.6449	1.9600	2.0000	2.3263	2.5758

2. Formulae

Spearman's Rank Correlation (with no ties)

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)}$$

The Pearson Correlation Function

$$R = r = \frac{n\sum x_i y_i - \sum x_i \sum y_i}{\sqrt{(n\sum x_i^2 - (\sum x_i)^2)(n\sum y_i^2 - (\sum y_i)^2)}}$$

Simple Linear Regression

$\hat{y} = mx_i + c$ is the least SSE straight line where:

$$m = \frac{\sum(x_i - \bar{x})(y_i - \bar{y})}{\sum(x_i - \bar{x})^2} \qquad m = \frac{n\sum x_i y_i - \sum x_i \sum y_i}{n\sum x_i^2 - (\sum x_i)^2}$$

$$c = \bar{y} - m\bar{x}$$

The Coefficient of Determination

$$R^2 = r^2 = \frac{\sum(\hat{y} - \bar{y})^2}{\sum(y - \bar{y})^2}$$

Marking note

Multiply original mark out of 50 by two, to produce final mark out of 100 to be recorded.

Learning Outcomes matrix

Question	Learning Outcomes assessed	Marker can differentiate between varying levels of achievement
1	2, 4	Yes
2	2, 4	Yes
3	2, 4	Yes
4	3	Yes
5	1, 5	Yes

Grade descriptors

Learning Outcome	Pass	Merit	Distinction
Be able to use various skills to support the study of Computing	Draw upon and make use of an adequate range of skills	Draw upon a variety of skills and make an appropriate selection	Draw upon a wide range of skills and make a highly appropriate selection
Be able to communicate in a technical environment	Demonstrate adequate standard of communication	Demonstrate strong and consistent standard of communication	Demonstrate highly skilful, exemplary standard of communication
Be able to deploy thinking skills and problem-solving paradigms in both a business and learning context.	Demonstrate adequate deployment of skills and paradigms	Demonstrate sound and appropriate deployment of skills and paradigms	Demonstrate highly effective deployment of skills and paradigms
Be able to handle and present data	Demonstrate ability to perform the task	Demonstrate ability to perform the task consistently well	Demonstrate ability to perform the task to the highest standard
Understand the need for lifelong learning	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding