



Designing and Developing a Website

December 2015

Sample Exam 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

Marks

Question 1

- a) i) What is the role of the W3C (World Wide Web Consortium)? 2
The W3C is a group of representatives from different organisations (1 mark) that oversee the development of web technologies and set standards for the web (1 mark).

- ii) Provide TWO (2) reasons why web standards are important. 2

Award 1 mark for each bullet point up to a maximum of 2 marks:

- ***Web standards have been agreed by a wide range of interested parties and represent best practice.***
- ***Using web standards ensures that websites are accessible to as many users as possible.***

- b) Designing a website for mobile devices raises particular issues. State TWO (2) issues that must be considered when designing a website for mobile devices. 2

Award 1 mark for each bullet point up to a maximum of 2 marks:

- ***Usability issues raised by small screen***
- ***Many different phone formats***
- ***Poor connectivity; slow download speeds.***

Note: Credit valid alternative answers

- c) i) Explain the difference between accessibility and usability. 2

Award 1 mark for each bullet point up to a maximum of 2 marks:

- ***Accessibility is about designing websites that are inclusive and accessible to as many users as possible, including designing websites for use by disabled users***
- ***Usability is about designing a site where users can accomplish tasks quickly and easily.***

Question 1 continues on next page

- ii) State TWO (2) reasons why accessibility is an important consideration in website design. **2**

Award 1 mark for each bullet point up to a maximum of 2 marks:

- ***Disabled users make up a significant proportion of web users and we should ensure that our sites are accessible to them***
- ***In many countries it is a legal requirement to ensure that sites are accessible***
- ***Accessible sites are easier for older web users to access***
- ***Accessible sites assist mobile users.***

Total: 10 Marks

Question 2

- a) Explain the purpose of HyperText Markup Language (HTML) 2
HTML is the mark-up language used to write web pages. (1 mark) It provides structures to the web pages, and identifies headings, paragraphs, tables, and lists (1 mark).
- b) Consider the following HTML code fragment:

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" lang="en" xml:lang="en" >
<head>
  <title>This is an example of a simple XHTML document</title>
  <meta http-equiv="content-type" content="text/html; charset=utf-8" />
</head>
<body>
  <h1>Welcome to <em>HTML</em></h1></em>
  <p>The purpose of this page is to illustrate a basic XHTML document</p>
</body>
</html>
```

Identify each of the elements below **and** explain the purpose of each element. In **each** case, state the code fragment to illustrate your answer **and** explain any attributes within the element.

- i) Document type declaration 2

Award 1 mark for correctly stating code fragment and 1 mark for the explanation up to a maximum of 2 marks.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
```

The document type declaration specifies the version of HTML that the page uses. In this case the declaration specifies that XHTML 1.0 Strict is the version being used.

Question 2 continues on next page

- ii) Root element 2

Award 1 mark for correctly stating code fragment and 1 mark for the explanation up to a maximum of 2 marks.

```
<html xmlns="http://www.w3.org/1999/xhtml" lang="en" xml:lang="en"
>
```

The Root element represents the root of an HTML document and can specify attributes such as language. In this case it specifies language as en (English). The xmlns attribute associates it with the XHTML namespace.

- iii) Head element 2

Award 1 mark for correctly stating code fragment and 1 mark for the explanation up to a maximum of 2 marks.

```
<head> <title>This is an example of a simple XHTML document</title>
  <meta http-equiv="content-type" content="text/html; charset=utf-8" /> </head>
```

The Head element provides information about the document and can include a title and meta data. In this case, the metadata specifies the character set.

- c) Explain the purpose of Nesting in HTML. Identify ONE (1) issue with the use of nesting in the code fragment in b) above. 2

Award 1 mark for each bullet point up to a maximum of 2 marks:

- **Nesting is used to place elements inside other elements, and to add structure to HTML code**
- **<h1>Welcome to HTML</h1> It is important to nest elements properly. In the code above the elements and <h1> elements overlap. Elements should be closed in the reverse order that they were opened.**

Total: 10 Marks

Question 3

- a) i) Explain the purpose of CSS (Cascading Style Sheets). 1
CSS specify the presentation of web pages.
- ii) Identify THREE (3) different ways of applying CSS to a webpage. 3

Award 1 mark for each bullet point up to a maximum of 3 marks:

- ***External style sheet: an external CSS file***
- ***Embedded style sheet, using the <style> tags***
- ***Inline style sheet, using the style attribute.***

- b) Consider the following HTML fragment:

```
<style>
li{
color:red;
}
ol .extra
{
font-family:Arial;
}
.extra{
background-color:green;
}
</style>
<body>
<ol>
<li class="extra">Beta</li>
<li>Alpha</li>
</ol>
<ul>
<li style="color:black">Delta</li>
<li class="extra">Gamma</li>
</ul>
```

Describe the appearance of each part of the text as below:

- i) Alpha 1
Coloured red.
- ii) Beta 1
Coloured red, green background, Arial font.

Question 3 continues on next page

- iii) Gamma 1
Coloured red, green background.
- iv) Delta 1
Coloured black.
- c) CSS can be used to support accessibility. Provide TWO (2) ways of how CSS can be used to help with accessibility. 2

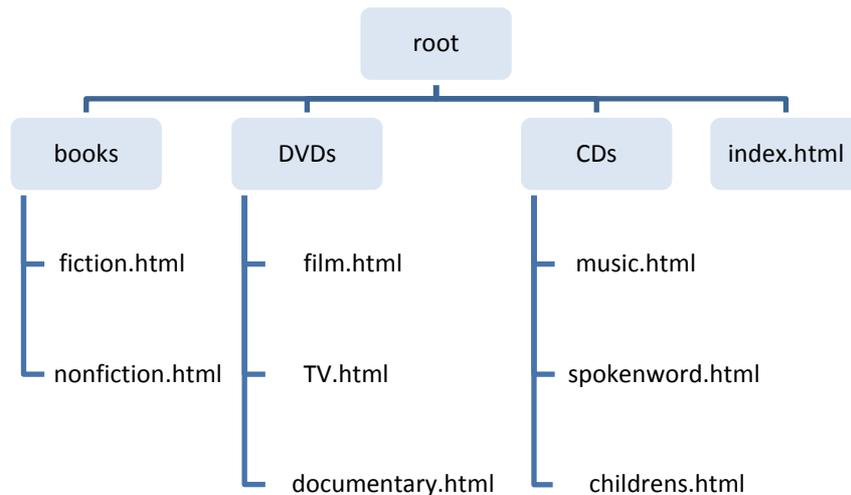
Award 1 mark for each bullet point up to a maximum of 2 marks:

- **CSS separates structured content from presentation**
- **Users can define their own style sheets**
- **Aural style sheets can be used to add sound.**

Total: 10 Marks

Question 4

a) Consider the following website structure:



- i) A hyperlink in the page *documentary.html* links to the page *childrens.html*. What will be the value of the *href* attribute for this hyperlink? **1**
../CDs/childrens.html
- ii) A hyperlink in the page *nonfiction.html* links to the page *index.html*. What will be the value of the *href* attribute for this hyperlink? **1**
../index.html
- iii) A hyperlink in the page *TV.html* links to the page *film.html*. What will be the value of the *href* attribute for this hyperlink? **1**
film.html
- iv) A hyperlink in the page *index.html* links to the page *fiction.html*. What will be the value of the *href* attribute for this hyperlink? **1**
short-cut/fiction.html
- b) i) Explain the purpose of skip links. **2**
Skip links allow the user to jump directly to the content of the page (1 mark) and are used by screen reader users for bypassing repetitive page content (1 mark).
- ii) Explain the purpose of access keys. **2**
Access keys, or the access key attribute, allow us to associate a specific key with a hyperlink (1 mark). They were originally intended to help with accessibility so that users could use the keyboard to navigate a web site by jumping to a particular part of the site at the press of a single key (1 mark).

Question 4 continues on next page

- ii) Access keys suffer from a number of problems. Provide TWO (2) examples of problems which access keys may suffer from. **2**

Award 1 mark for each bullet point up to a maximum of 2 marks:

- ***Different browsers use different modifier keys.***
- ***They may conflict with browser shortcuts.***
- ***There is no standardisation of access keys.***
- ***They can conflict with screen reader software.***

Total: 10 Marks

Question 5

- a) Web browsers support image file formats including PNG, GIF and JPEG. The following images need to be saved in an appropriate file format for display within a web page.

Which file format would you suggest be used to store the images shown below? In each case briefly explain your reasons for suggesting that particular file format.

- i) A photograph of a brightly coloured bird. 2

Award 1 mark for correct identification of file format, and 1 mark for a valid reason for choosing that format, up to a maximum of 2 marks.

JPEG – The photograph of the bird will include many different colours. The 24 bit JPEG format can be used to display millions of different colour shades within a small file size.

- ii) A map of a railway network showing all possible routes between two cities. 2

Award 1 mark for correct identification of file format, and 1 mark for a valid reason for choosing that format.

8 bit PNG or GIF – the map features a limited number of colours, and an 8 bit image should be sufficient for this.

- b) Video and audio are now accepted and important parts of the web. However, its use raises a number of issues for web designers.

- i) State TWO (2) issues which are raised by the use of audio or video. For **each** issue you raise, suggest ONE (1) solution that might be used to address the issue. 4

Award 1 mark for each issue and 1 mark for a valid solution to the issue up to a maximum of 4 marks. Valid issues and solutions include:

- **Issue: Video and audio files are very large. Solution: use of compression software e.g. Codec.**
- **Issue: There are many different formats, each of which require a different player. Solution: embed the media player in the webpage using the <object> format.**

Note: Credit alternative valid issues and solutions.

Question 5 continues on next page

- ii) What are the particular issues of using media (video and audio) on a mobile device? **2**

Award 1 mark for each bullet point up to a maximum of 2 marks.

- ***Slower network speeds***
- ***Paying for data transfer***
- ***Small screens: many mobile devices have screens less than 200px wide.***

Note: Credit alternative valid answers.

Total: 10 Marks

Question 6

- a) Identify THREE (3) HTML features that can be used to enhance the accessibility of tables. For **each** feature, suggest ONE (1) way of how it enhances responsibility. 6

The maximum number of marks awarded to this question is 6.

Award 1 mark for each feature and 1 mark for an explanation of how the feature enhances accessibility. Valid features and explanations include:

- *The <caption> element – it provides a title for the table*
- *The summary attribute – it can be used to describe the structure of the table, and is useful for complex table structures*
- *The <th> element – it describes the data and distinguishes the header from the data; this information can be used by screen readers.*

- b) Explain the purpose of the *colspan* and *rowspan* attributes. 2
The colspan attribute can be used to stretch a table cell across multiple columns (1 mark). The rowspan attribute can be used to stretch a table cell across multiple rows (1 mark).

Question 6 continues on next page

Question 7

a) Consider the following HTML and CSS fragment:

6

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html>
<html>
<head>
<style>
div{
outline:1px solid black;
}

#block1{
position:absolute;
top:250px;
left:200px;
height:10px;
width:50px;
}

#block2{
position:absolute;
top:150px;
left:100px;
height:100px;
width:100px;
}

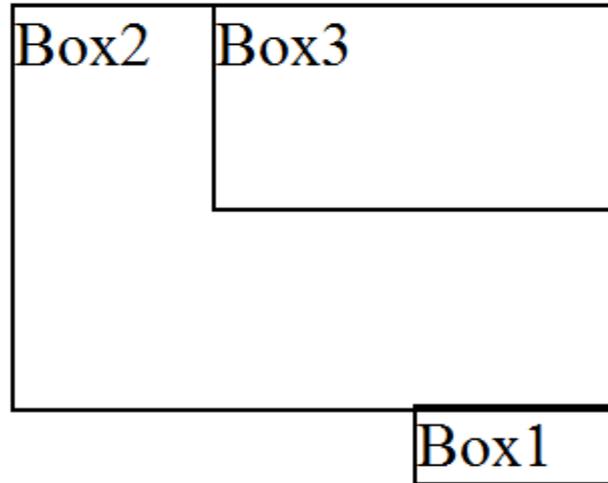
#block3{
position:absolute;
top:0px;
left:50px;
height:50px;
width:100px;
}
</style>
</head>

<body>
<div id="block1">Box1</div>
<div id="block2">Box2<div id="block3">Box3</div></div>
</body>
</html>
```

Draw a diagram showing how the page will appear when rendered in a browser.

Question 7 continues on next page

The boxes will appear like this when rendered:



The maximum number of marks awarded to this question is 6. Award up to 3 marks for boxes of approximately the correct size and shape (i.e. the student had understood the application of the <div> width and height elements). Award up to 3 marks for placing the boxes in the correct positions.

- b) When designing a website and using CSS to control page layout, a designer will usually follow a process. Explain the process you would follow when controlling page layout with CSS. **4**

Award 1 mark for each bullet point up to a maximum of 4 marks:

- **Mark-up the page with HTML elements to define meaning.**
- **Add <div> elements to describe different parts of the page.**
- **Use the width and float properties to create a basic page layout.**
- **Add finishing CSS touches – colours, fonts, etc.**

Total: 10 Marks

Question 8

- a) Business to Consumer (B2C) is one model that is widely used for eCommerce. Identify THREE (3) other models used for eCommerce. You should provide ONE (1) example of a type of online business that fits each model that you identify. 6

The maximum number of marks for each question is 6. Award 1 mark for each model and 1 mark for the example.

- **Model: B2B (Business to Business). Example: a manufacturer ordering raw materials from a supplier through a private network**
- **Model: C2C (Consumer to Consumer). Example: Auction websites such as ebay where customers sell their own items to other customers**
- **Model: P2P: Hollywood studios distributing films using P2P network.**

- b) Briefly explain what is meant by *user-centred web design*. 2
User centre-web design considers users at each stage of the design process (1 mark) Users are involved at each stage, commenting on and testing prototype pages and structures (1 mark)

- c) Briefly explain what is meant by a *persona* in terms of web design **and** outline its purpose. 2

Award 1 mark for each bullet point up to a maximum of 2 marks:

- ***A persona is a fictional description of a typical user, based on research of the user community***
- ***A persona includes specific details (name, age, gender, computer specification, IT literacy, etc.)***
- ***The use of personas helps keep users in mind during the design process.***

Total: 10 Marks

Question 9

- a) The process of web design can be thought of as a three stage process: (1) Research; (2) Design; and (3) Implementation.
- i) State TWO (2) processes or actions involved in each of the following stages listed above. 6

The maximum number of marks awarded to this question is 6. Award 1 mark for each bullet point up to a maximum of 2 marks per stage.

Research

- ***Defining goals***
- ***Learning about users***
- ***Defining content and functionality***

Design

- ***Designing site structure***
- ***Designing navigation***
- ***Interface design***

Implementation

- ***Writing HTML and CSS***
- ***Using Web Development Tools***
- ***Final testing and evaluation.***

- ii) Where does testing and evaluation fit within the above process? 1
Testing and evaluation should take place throughout the process, with final testing at the end.

- b) Explain what is meant by *breadcrumb navigation* and state TWO (2) advantages of its use. 3

Award 1 mark for the following bullet point:

- ***Breadcrumb navigation displays the user's current location within the hierarchy of the web site.***

Award 1 mark for each bullet point up to a maximum of 2 marks:

- ***Easy to retrace steps***
- ***Useful in large sites with deep hierarchies; prevents getting "lost"***
- ***Simplicity: easy to follow and take up very little space.***

Total: 10 Marks

Question 10

- a) State TWO (2) advantages that are offered by usability testing. 2

Award 1 mark for each bullet point to a maximum of 2 marks:

- **Exposes site to real users**
- **Can be done at an early stage on draft pages**
- **Simple and easy to do**
- **Identifies changes which are needed to improve the site.**

- b) It is important to test the accessibility of a web site before releasing it for use. 2
State TWO (2) ways in which a web designer might test the accessibility of a web site.

Award 1 mark for each bullet point to a maximum of 2 marks:

- **Testing using screen readers or emulators (e.g. JAWS)**
- **Use a testing tool such as WAVE (Web Accessibility Evaluation Tool)**
- **Use tools recommended by W3C.**

- c) Krug's Trunk Test tests to see if site navigation is well designed. Identify SIX (6) areas that are covered by the Trunk Test. For each area, you should suggest a question that should be asked by a user. 6

The maximum number of marks awarded to this question is 6. Award ½ marks for stating each area and ½ marks for asking a relevant question.

- **Site ID: What site is this?**
- **Page Name: What page am I on?**
- **Sections: What are the major sections of this site?**
- **Local Navigation: What are my options at this level?**
- **You Are Here: Where am I in the scheme of things?**
- **Search: How can I search?**

Note: Credit valid alternative questions.

Total: 10 Marks

End of Examination Paper

Learning Outcomes matrix

Question	Learning Outcomes assessed	Marker can differentiate between varying levels of achievement
1	5, 6	Yes
2	2	Yes
3	2	Yes
4	2	Yes
5	3	Yes
6	2	Yes
7	2	Yes
8	6	Yes
9	1, 2, 5	Yes
10	1, 2, 4, 5	Yes

Grade descriptors

Learning Outcome	Pass	Merit	Distinction
Design a website to address loosely-defined requirements	Provide adequate design to address the specification	Provide detailed and appropriate design to address the specification	Provide wholly appropriate and innovative design that meets the specification
Use web development tools to build (X)HTML- and CSS-based websites to address well-defined specifications	Demonstrate adequate and appropriate ability to build artefact	Demonstrate sound and consistently appropriate ability to build artefact	Demonstrate exceptional ability to build artefact
Understand the technology and tools needed to use multimedia in the context of a website	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Develop test strategies and apply these to a website	Show adequate development	Show sound and appropriate development	Show innovative and highly appropriate development
Understand the need for Web standards	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding
Understand the concepts associated with using the Internet and the World Wide Web for business	Demonstrate adequate level of understanding	Demonstrate robust level of understanding	Demonstrate highly comprehensive level of understanding