Grade 13 A/L ICT

Lesson 10: Web Development

- 10.1 The World Wide Web and Types of Websites
- 10.2 Analysing User Requirements for a Website
- 10.3 HTML Tags for a Single Web Page
- 10.4 Linked Web Pages: Hyperlinks, Lists, Images, Tables and Multimedia
- 10.5 Cascading Style Sheets (CSS)
- 10.6 Web Authoring Tools
- 10.7 Dynamic Web Pages with PHP and MySQL
- 10.8 Publishing and Maintaining Websites

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10.1 The World Wide Web and Types of Websites

Syllabus 10.1. The **World Wide Web (WWW)** is a huge collection of linked **web pages** stored on **web servers** and reached through the Internet with a **web browser**. Pages are joined by **hyperlinks** and found by their **URL**. Websites are grouped by purpose: **information/news**, **personal**, **educational**, **commercial**, **research** and **web portals**.

1. How the web works

The World Wide Web: client and server



URL example: https://www.nie.lk/index.html → protocol · domain name · file

Browser, Internet and web server

- The **Internet** is the network of networks; the **WWW** is one service that runs on it, like e-mail.
- A **browser** (Chrome, Firefox, Edge) sends an **HTTP** request; the **web server** sends back HTML.
- A **URL** such as https://www.nie.lk/index.html has a protocol, a domain name and a file path.
- A **website** is a set of related web pages under one domain, starting from a **home page**.

2. Types of websites

Type	Purpose	Sri Lankan example
Information / news	Up-to-date news and facts	a daily newspaper site
Personal	About one person, blog or portfolio	a teacher's blog
Educational	Lessons, syllabuses and e-learning	nie.lk, e-thaksalawa
Commercial	Selling goods and services online	an online shop
Research	Publishing research papers and data	a university research site
Web portal	One gateway to many services and links	gov.lk government portal

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🧱 **Worked example: Classify: (a) a site where you pay electricity bills and reach many government services, (b) a site selling phones.**
(a) **Web portal** – one entry point to many services. (b) **Commercial** – its main purpose is selling.

3. A home page

HTML: Home page with a navigation menu

```
<!DOCTYPE html>
<html>
<head>
  <title>Green Valley School</title>
</head>
<body>
  <h1>Green Valley School</h1>
  <p>
    <a href="index.html">Home</a> |
    <a href="about.html">About</a> |
    <a href="news.html">News</a> |
    <a href="contact.html">Contact</a>
  </p>
  <h2>Latest news</h2>
  <p>Sports meet on 12 March.</p>
</body>
</html>
```

▶ **Result in the browser**

Green Valley School

Home | About | News | Contact

Latest news

Sports meet on 12 March.

💡 Think of the web as a library: pages are books, URLs are shelf numbers and hyperlinks are "see also" notes.

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* In 2026 many sites are web apps (PWAs) that work offline and install like phone apps, but they are still built from HTML, CSS and JavaScript.

Key Words

World Wide Web – System of linked pages reached over the Internet.

Web page – Single document written in HTML.

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Website – Group of related web pages under one domain.

Web browser – Program that requests and displays web pages.

Web server – Computer that stores and sends web pages.

URL – Address of a resource on the web.

HTTP – Protocol used to request and send web pages.

Hyperlink – Clickable link to another page or place.

Home page – First page of a website.

Web portal – Website that is a gateway to many services.

Commercial website – Website that sells goods or services.

Domain name – Human-readable name of a web server such as nie.lk.

Sample Q&A

1. Internet vs WWW?

> **Answer:** The Internet is the network; the WWW is a service of linked pages on it.

2. Role of a web browser?

> **Answer:** Requests pages with HTTP and displays the HTML.

3. Parts of https://www.nie.lk/index.html?

> **Answer:** Protocol https, domain www.nie.lk, file index.html.

4. What is a web portal?

> **Answer:** A site that gives one gateway to many services.

5. Example of an educational site?

> **Answer:** nie.lk or e-thaksalawa.

6. What is a home page?

> **Answer:** The first page of a website that links to the others.

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MCQ

1. The WWW is best described as

A. a web browser
B. a programming language
C. a service of linked pages on the Internet
D. the Internet itself
E. an e-mail system

2. Which program displays web pages?

A. DBMS
B. web server
C. FTP server
D. compiler
E. web browser

3. The protocol used to request web pages is

A. HTTP
B. POP3
C. SMTP
D. FTP only
E. SQL

4. In https://www.nie.lk/index.html the domain name is

A. https
B. index.html
C. /index
D. www.nie.lk
E. lk/index.html

5. A site that is a gateway to many government services is a

A. research site
B. personal site
C. web portal
D. blog
E. search index

6. An online shop is a

A. research website
B. commercial website
C. news website
D. web portal only
E. personal website

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7. The first page of a website is the

A. home page
B. server page
C. style sheet
D. error page
E. last page

8. A teacher’s blog about herself is a

A. web portal
B. research database
C. personal website
D. news agency site
E. commercial website

9. Which term means: “System of linked pages reached over the Internet”?

A. Hyperlink
B. URL
C. Website
D. Commercial website
E. World Wide Web

10. Which term means: “Single document written in HTML”?

A. HTTP
B. Web page
C. Home page
D. Web browser
E. Domain name

11. Which term means: “Group of related web pages under one domain”?

A. Web server
B. Hyperlink
C. World Wide Web
D. Web portal
E. Website

12. Which term means: “Program that requests and displays web pages”?

A. Home page
B. Commercial website
C. Web page
D. Web browser
E. URL

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13. Which term means: “Computer that stores and sends web pages”?

A. HTTP
B. Web portal
C. Website
D. Web server
E. Domain name

14. Which term means: “Address of a resource on the web”?

A. URL
B. World Wide Web
C. Hyperlink
D. Web browser
E. Commercial website

15. Which term means: “Protocol used to request and send web pages”?

A. HTTP
B. Web page
C. Domain name
D. Home page
E. Web server

16. Which term means: “Clickable link to another page or place”?

A. World Wide Web
B. Website
C. URL
D. Web portal
E. Hyperlink

17. Which term means: “First page of a website”?

A. Web browser
B. Home page
C. HTTP
D. Web page
E. Commercial website

18. Which term means: “Website that is a gateway to many services”?

A. Website
B. Web server
C. Web portal
D. Domain name
E. Hyperlink

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19. Which term means: “Website that sells goods or services”?

A. World Wide Web
B. Commercial website
C. Home page
D. URL
E. Web browser

20. Which term means: “Human-readable name of a web server such as nie.lk”?

A. Web portal
B. Web page
C. Web server
D. Domain name
E. HTTP

Structured Questions

1. Distinguish the Internet and the World Wide Web. *(3 marks)*

> Network of networks; service of linked pages; example.

2. Explain how a browser gets a page from a web server. *(4 marks)*

> URL typed; HTTP request; server sends HTML; browser displays.

3. Name the parts of a URL with an example. *(2 marks)*

> Protocol, domain name, path/file.

4. Describe four types of websites with examples. *(2 marks)*

> Any four of news, personal, educational, commercial, research, portal.

5. Explain why a school needs a website. *(4 marks)*

> Share news, notices, results; contact; image; e-learning.

Summary

- The WWW is linked pages on the Internet.
- Browsers request; servers respond with HTML.
- A URL locates a page.
- Sites are news, personal, educational, commercial, research or portals.
- A website starts at its home page.

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MCQ answer key – 10.1

1. **C** – Service.
2. **E** – Browser.
3. **A** – HTTP.
4. **D** – Domain.
5. **C** – Portal.
6. **B** – Selling.
7. **A** – Home page.
8. **C** – Personal.
9. **E** – World Wide Web – System of linked pages reached over the Internet.
10. **B** – Web page – Single document written in HTML.
11. **E** – Website – Group of related web pages under one domain.
12. **D** – Web browser – Program that requests and displays web pages.
13. **D** – Web server – Computer that stores and sends web pages.
14. **A** – URL – Address of a resource on the web.
15. **A** – HTTP – Protocol used to request and send web pages.
16. **E** – Hyperlink – Clickable link to another page or place.
17. **B** – Home page – First page of a website.
18. **C** – Web portal – Website that is a gateway to many services.
19. **B** – Commercial website – Website that sells goods or services.
20. **D** – Domain name – Human-readable name of a web server such as nie.lk.

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10.2 Analysing User Requirements for a Website

Syllabus 10.2. Before writing any HTML, plan the site: define its **objectives** and **target users**, decide the **contents** (text, images, audio, video) of each page, list the **web pages** and choose a **navigation structure**. A **site map** or **storyboard** records this plan.

1. Planning steps

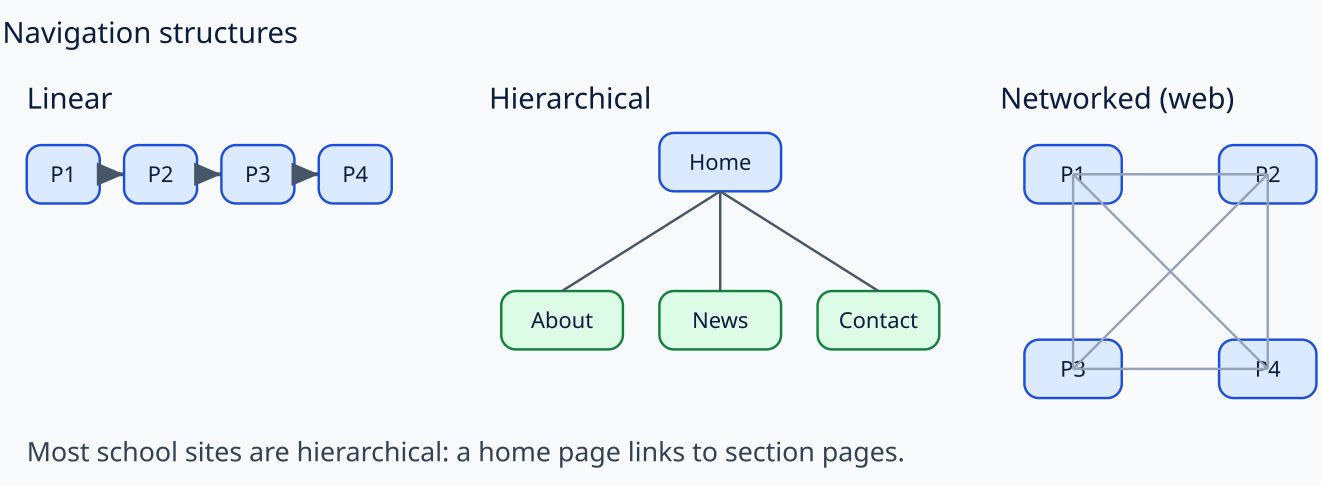
Objectives
Why the site exists, e.g. share school news and results.

Users
Students, parents, teachers, past pupils.

Contents
Text, images, audio and video needed on each page.

Pages and navigation
List the pages and how users move between them.

2. Navigation structures



Linear, hierarchical and networked navigation

Structure	Best for
Linear	Step-by-step tutorials or a slide show
Hierarchical	Most school and business sites (home → sections → pages)
Networked	Wikis and encyclopaedias where any page links to any other

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🧱 **Worked example: Plan a website for the school ICT club.**
Objective: share club news and register members. Pages: **Home, About, Events, Gallery, Register** (5 pages). Contents: text and a logo on Home, photos on Gallery, a form on Register. Navigation: **hierarchical** – Home links to the four section pages and each page has a menu back to Home.

HTML: Home page with a navigation menu

```
<!DOCTYPE html>
<html>
<head>
  <title>Green Valley School</title>
</head>
<body>
  <h1>Green Valley School</h1>
  <p>
    <a href="index.html">Home</a> |
    <a href="about.html">About</a> |
    <a href="news.html">News</a> |
    <a href="contact.html">Contact</a>
  </p>
  <h2>Latest news</h2>
  <p>Sports meet on 12 March.</p>
</body>
</html>
```

▶ **Result in the browser**

Green Valley School

Home | About | News | Contact

Latest news

Sports meet on 12 March.

💡 Keep the menu in the same place on every page and limit it to about 5–7 items.

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* In 2026 designers start with a mobile-first wireframe in tools such as Figma and test it with real users before coding.

Key Words

Objective – Purpose that the website must achieve.

Target audience – Group of people the site is made for.

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User requirement – What users need the site to provide.

Content – Text, images, audio and video shown on a page.

Multimedia – Combination of text, images, sound and video.

Navigation – How users move between pages.

Navigation bar – Menu of links shown on every page.

Linear structure – Pages visited one after another in order.

Hierarchical structure – Tree of pages below a home page.

Networked structure – Pages that link freely to each other.

Site map – Diagram listing all pages and their links.

Storyboard – Sketch of each page layout before building.

Sample Q&A

1. First step in planning a site?

> **Answer:** Define the objectives and target users.

2. Name three navigation structures.

> **Answer:** Linear, hierarchical, networked.

3. Best structure for a school site?

> **Answer:** Hierarchical.

4. What is a site map?

> **Answer:** A diagram of all pages and links.

5. How many pages in the ICT club plan?

> **Answer:** 5.

6. Why keep the menu in one place?

> **Answer:** Users find it easily – consistent navigation.

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MCQ

1. The first step in website planning is to

A. define objectives and users
B. buy a domain
C. write PHP
D. upload the files
E. choose colours

2. Pages visited one after another in order form a

A. portal
B. linear structure
C. hierarchical structure
D. networked structure
E. database

3. Home → sections → pages is a

A. hierarchical structure
B. linear structure
C. flat file
D. loop
E. networked structure

4. A wiki where any page links to any other uses a

A. linear structure
B. hierarchical only
C. networked structure
D. sequential file
E. single page

5. A diagram listing all pages and their links is a

A. URL
B. site map
C. cookie
D. web server
E. style sheet

6. Text, images, sound and video together are

A. metadata
B. plain text
C. protocols
D. multimedia
E. hypertext only

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7. The ICT club plan has how many pages?

A. 5
B. 4
C. 7
D. 6
E. 3

8. A menu of links on every page is a

A. footer note
B. database table
C. site map file
D. server log
E. navigation bar

9. Which term means: “Purpose that the website must achieve”?

A. Objective
B. Navigation
C. User requirement
D. Linear structure
E. Site map

10. Which term means: “Group of people the site is made for”?

A. Content
B. Target audience
C. Navigation bar
D. Storyboard
E. Hierarchical structure

11. Which term means: “What users need the site to provide”?

A. Networked structure
B. Objective
C. Multimedia
D. User requirement
E. Linear structure

12. Which term means: “Text, images, audio and video shown on a page”?

A. Navigation
B. Site map
C. Hierarchical structure
D. Target audience
E. Content

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13. Which term means: “Combination of text, images, sound and video”?

A. Storyboard
B. Networked structure
C. User requirement
D. Navigation bar
E. Multimedia

14. Which term means: “How users move between pages”?

A. Content
B. Navigation
C. Site map
D. Linear structure
E. Objective

15. Which term means: “Menu of links shown on every page”?

A. Storyboard
B. Target audience
C. Hierarchical structure
D. Navigation bar
E. Multimedia

16. Which term means: “Pages visited one after another in order”?

A. Networked structure
B. User requirement
C. Linear structure
D. Navigation
E. Objective

17. Which term means: “Tree of pages below a home page”?

A. Site map
B. Target audience
C. Navigation bar
D. Hierarchical structure
E. Content

18. Which term means: “Pages that link freely to each other”?

A. Multimedia
B. User requirement
C. Networked structure
D. Linear structure
E. Storyboard

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19. Which term means: “Diagram listing all pages and their links”?

A. Objective
B. Content
C. Site map
D. Hierarchical structure
E. Navigation

20. Which term means: “Sketch of each page layout before building”?

A. Target audience
B. Navigation bar
C. Multimedia
D. Networked structure
E. Storyboard

Structured Questions

1. List the steps of analysing user requirements for a website. *(5 marks)*

> Objectives; users; contents; pages; navigation.

2. Compare linear, hierarchical and networked navigation. *(4 marks)*

> Order; tree; free links; uses.

3. Plan the pages and contents of a school ICT club site. *(2 marks)*

> Five pages with contents; hierarchical.

4. Explain why multimedia content should be chosen carefully. *(3 marks)*

> Attract users; but size slows loading; accessibility.

5. Draw a site map for a five-page site. *(3 marks)*

> Home at top; four children; links back.

Summary

- Plan before coding.
- Define objectives and users first.
- Decide contents for each page.
- Choose linear, hierarchical or networked navigation.
- Record the plan in a site map.

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MCQ answer key – 10.2

1. **A** – Objectives first.
2. **B** – Linear.
3. **A** – Tree.
4. **C** – Networked.
5. **B** – Site map.
6. **D** – Multimedia.
7. **A** – Home, About, Events, Gallery, Register.
8. **E** – Nav bar.
9. **A** – Objective – Purpose that the website must achieve.
10. **B** – Target audience – Group of people the site is made for.
11. **D** – User requirement – What users need the site to provide.
12. **E** – Content – Text, images, audio and video shown on a page.
13. **E** – Multimedia – Combination of text, images, sound and video.
14. **B** – Navigation – How users move between pages.
15. **D** – Navigation bar – Menu of links shown on every page.
16. **C** – Linear structure – Pages visited one after another in order.
17. **D** – Hierarchical structure – Tree of pages below a home page.
18. **C** – Networked structure – Pages that link freely to each other.
19. **C** – Site map – Diagram listing all pages and their links.
20. **E** – Storyboard – Sketch of each page layout before building.

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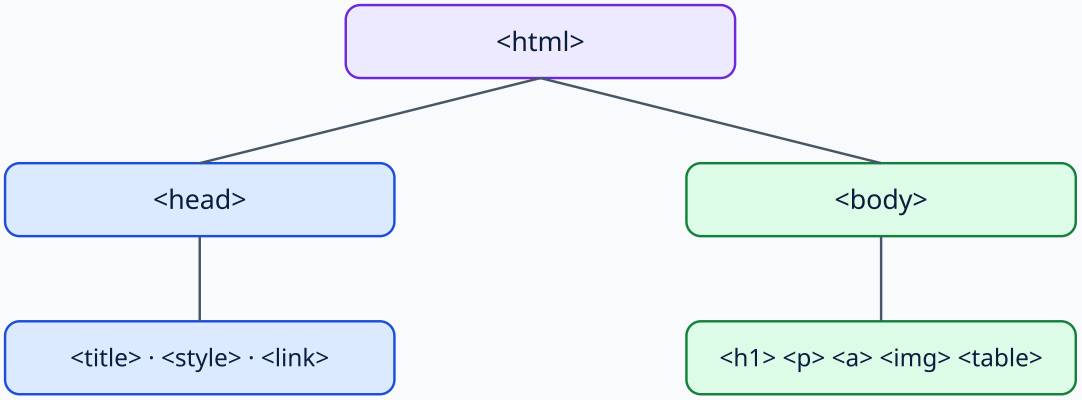
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10.3 HTML Tags for a Single Web Page

Syllabus 10.3. HTML describes a page with **tags** written in angle brackets. Every page has a **page definition** <html>…</html>, a **head section** <head> with the <title>, and a **body section** <body> with the visible content. Inside the body you format text with <h1>–<h6>, <p>, <br/>, <b>, <i>, <u> and <font>, set a **background colour** and add **comments**.

1. Structure of a page

Structure of an HTML document



head = information about the page (not shown) · body = content shown in the browser

The html, head and body sections

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HTML: A single web page

```
<!DOCTYPE html>
<html>
<head>
  <title>My First Page</title>
</head>
<body bgcolor="lightyellow">
  <!-- This is a comment: the browser does not show it -->
  <h1>Sri Lanka</h1>
  <h3>The pearl of the Indian Ocean</h3>
  <p>Sri Lanka is an <b>island</b> with <i>beautiful</i> beaches.<br/>
     Capital: <u>Sri Jayawardenepura Kotte</u></p>
  <p><font size="5" color="blue">Big blue text</font></p>
</body>
</html>
```

▶ **Result in the browser**

Sri Lanka

The pearl of the Indian Ocean

Sri Lanka is an **island** with *beautiful* beaches.
Capital: Sri Jayawardenepura Kotte

Big blue text

Tag	Meaning
<html> … </html>	Starts and ends the page
<head> … </head>	Information about the page (not shown)
<title> … </title>	Text in the browser tab
<body bgcolor="…">	Visible content; background colour
<h1> … <h6>	Headings: h1 largest, h6 smallest
…	Paragraph
 	Line break – an empty tag with no end tag
<b> <i> <u>	Bold, italic, underline
<font size="1–7" color="…">	Text size (default 3) and colour
<!-- … -->	Comment – not displayed

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🧱 **Worked example: Why does the comment not appear in the preview, and which heading is bigger?**
Text between <!-- and --> is a **comment** for the programmer, so the browser ignores it. <h1> “Sri Lanka” is **larger** than <h3>, because h1 is the top-level heading.

- Tags usually come in pairs: a start tag and an end tag .
- **Attributes** give extra information inside the start tag: name="value", e.g. bgcolor="lightyellow".
- Save the file with the extension **.html** or **.htm** and open it in a browser.
- <font> and bgcolor are in the syllabus but are old; HTML5 pages use CSS for colours and fonts (Lesson 10.5).

💡 Indent nested tags and close every tag you open – it makes errors easy to spot.

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* HTML5 semantic tags such as <header>, <nav>, <main> and <footer> are standard in 2026 and help search engines and screen readers.

Key Words

HTML – HyperText Markup Language used to build web pages.	**Tag** – Keyword in angle brackets such as .
Element – Start tag, content and end tag together.	**Attribute** – Extra setting inside a start tag as name="value".
Head section – Part holding page information such as the title.	**Body section** – Part holding the visible content.
Title – Text shown in the browser tab.	**Heading tag** – h1 to h6 headings with h1 the largest.
Paragraph – Block of text in p tags.	**Line break** – br tag that starts a new line.
Empty tag – Tag with no end tag such as br.	**Comment** – Note between <!-- and --> that is not displayed.

Sample Q&A

1. Three sections of every HTML page?

Answer: Page definition html, head and body.

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2. Where is the title shown?

> **Answer:** In the browser tab.

3. Largest heading tag?

> **Answer:** h1.

4. Why is br an empty tag?

> **Answer:** It has no content and no end tag.

5. How do you write a comment?

> **Answer:** Between <!-- and -->.

6. Default font size?

> **Answer:** 3 (range 1–7).

MCQ

1. The text in the browser tab is set by

A. <head>
B. <title>
C. <p>
D. <body>
E. <h1>

2. The visible content of a page is inside

A. <!-- -->
B. <title>
C. <body>
D. <meta>
E. <head>

3. The largest heading is

A. <h6>
B. <h3>
C. <head>
D. <h1>
E. <p>

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4. Which tag has no end tag?

A. <h2>
B.
C. <p>
D. <b>
E. <title>

5. Text between <!-- and --> is

A. a hyperlink
B. shown in bold
C. an error
D. shown in the title bar
E. not shown by the browser

6. bgcolor="lightyellow" is an example of an

A. URL
B. element
C. end tag
D. comment
E. attribute

7. <u>Kotte</u> shows Kotte

A. underlined
B. as a heading
C. hidden
D. bold
E. italic

8. A suitable file name for a web page is

A. index.exe
B. index.php.txt
C. index.html
D. index.css
E. index.docx

9. Which term means: “HyperText Markup Language used to build web pages”?

A. HTML
B. Element
C. Empty tag
D. Heading tag
E. Body section

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10. Which term means: “Keyword in angle brackets such as <p>”?

A. Title
B. Tag
C. Paragraph
D. Attribute
E. Comment

11. Which term means: “Start tag, content and end tag together”?

A. Element
B. Line break
C. Heading tag
D. HTML
E. Head section

12. Which term means: “Extra setting inside a start tag as name="value"”?

A. Tag
B. Body section
C. Empty tag
D. Paragraph
E. Attribute

13. Which term means: “Part holding page information such as the title”?

A. Comment
B. Element
C. Line break
D. Head section
E. Title

14. Which term means: “Part holding the visible content”?

A. Attribute
B. Heading tag
C. Empty tag
D. Body section
E. HTML

15. Which term means: “Text shown in the browser tab”?

A. Head section
B. Comment
C. Title
D. Paragraph
E. Tag

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16. Which term means: “h1 to h6 headings with h1 the largest”?

A. Heading tag
B. Element
C. Body section
D. Line break
E. HTML

17. Which term means: “Block of text in p tags”?

A. Attribute
B. Title
C. Paragraph
D. Empty tag
E. Tag

18. Which term means: “br tag that starts a new line”?

A. Comment
B. Heading tag
C. Element
D. Line break
E. Head section

19. Which term means: “Tag with no end tag such as br”?

A. Body section
B. Empty tag
C. Attribute
D. Paragraph
E. HTML

20. Which term means: “Note between <!-- and --> that is not displayed”?

A. Head section
B. Line break
C. Tag
D. Title
E. Comment

Structured Questions

1. Write the basic structure of an HTML page. *(4 marks)*

> html; head with title; body; closing tags.

2. Explain tag, element and attribute with an example. *(3 marks)*

> tag; text element; bgcolor="..." attribute.

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3. Write HTML for a heading, a paragraph with bold and italic words, and a line break. *(3 marks)*

> <h1>; <p> with <b>, <i>;
.

4. Explain the purpose of comments in HTML. *(3 marks)*

> Notes for programmers; ignored; explain or hide code.

5. Explain why <font> is replaced by CSS in HTML5. *(2 marks)*

> Separate content and style; one CSS file for many pages.

Summary

- A page has html, head and body sections.
- title appears in the browser tab.
- h1–h6, p, br format text.
- b, i, u and font style words.
- Comments are not displayed.

MCQ answer key – 10.3

1. **B** – Title.
2. **C** – Body.
3. **D** – h1.
4. **B** – Empty tag.
5. **E** – Comment.
6. **E** – Attribute.
7. **A** – Underline.
8. **C** – .html extension.
9. **A** – HTML – HyperText Markup Language used to build web pages.
10. **B** – Tag – Keyword in angle brackets such as <p>.
11. **A** – Element – Start tag, content and end tag together.
12. **E** – Attribute – Extra setting inside a start tag as name="value".
13. **D** – Head section – Part holding page information such as the title.
14. **D** – Body section – Part holding the visible content.
15. **C** – Title – Text shown in the browser tab.
16. **A** – Heading tag – h1 to h6 headings with h1 the largest.
17. **C** – Paragraph – Block of text in p tags.
18. **D** – Line break – br tag that starts a new line.
19. **B** – Empty tag – Tag with no end tag such as br.
20. **E** – Comment – Note between <!-- and --> that is not displayed.

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Grade 13 A/L ICT · Lesson 10

10.4 Linked Web Pages: Hyperlinks, Lists, Images, Tables and Multimedia

Syllabus 10.4. Hypertext is text with links. A website has a **home page** and **linked pages** joined by **hyperlinks** made with <a href>. Links can go to a **bookmark** in the same page, to another page of the **same site (local link)** or to **another site (external link)**. Pages also organise data with **lists** and **tables** and include **images**, **audio** and **video**.

1. Hyperlinks

HTML: Three kinds of hyperlink

```
<!DOCTYPE html>
<html>
<head>
  <title>Links</title>
</head>
<body>
  <p><a href="#contact">Go to Contact (bookmark)</a></p>
  <p><a href="news.html">School news (local link)</a></p>
  <p><a href="https://www.nie.lk" target="_blank">NIE website (external link)</a></p>
  <h2 id="contact">Contact</h2>
  <p>Phone: 011 234 5678</p>
</body>
</html>
```

▶ **Result in the browser**

Go to Contact (bookmark)

School news (local link)

NIE website (external link)

Contact

Phone: 011 234 5678

Link type	href value
Bookmark (same page)	#contact – jumps to id="contact"
Local link (same site)	news.html
External link (other site)	https://www.nie.lk

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2. Lists

HTML: Ordered, unordered and definition lists

```
<!DOCTYPE html>
<html>
<head>
  <title>Lists</title>
</head>
<body>
  <ol type="1">
    <li>Switch on</li>
    <li>Log in</li>
  </ol>
  <ul type="square">
    <li>Mouse</li>
    <li>Keyboard</li>
  </ul>
  <dl>
    <dt>CPU</dt>
    <dd>Central Processing Unit</dd>
  </dl>
</body>
</html>
```

▶ **Result in the browser**

1. Switch on
2. Log in

- Mouse
- Keyboard

CPU
: Central Processing Unit

- **ordered list** – numbered; type="1", "A", "a", "I" or "i".
- **unordered list** – bullets; type="disc", "circle" or "square".
- <dl> **definition list** – <dt> term and <dd> its description.

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3. Tables

HTML: Table with caption and merged cells

```
<!DOCTYPE html>
<html>
<head>
  <title>Timetable</title>
</head>
<body>
  <table border="1">
    <caption>Monday timetable</caption>
    <tr>
      <th>Time</th>
      <th colspan="2">Subjects</th>
    </tr>
    <tr>
      <td rowspan="2">Morning</td>
      <td>ICT</td>
      <td>Maths</td>
    </tr>
    <tr>
      <td>Physics</td>
      <td>Chemistry</td>
    </tr>
  </table>
</body>
</html>
```

▶ **Result in the browser**

Monday timetable

Time	Subjects	
Morning	ICT	Maths
	Physics	Chemistry

colspan and rowspan

Time	Subjects (colspan=2)	
Morning (rowspan=2)	ICT	Maths
	Physics	Chemistry

Grid: 3 rows × 3 columns. A merged cell uses the space of the cells it covers.

How colspan and rowspan merge cells

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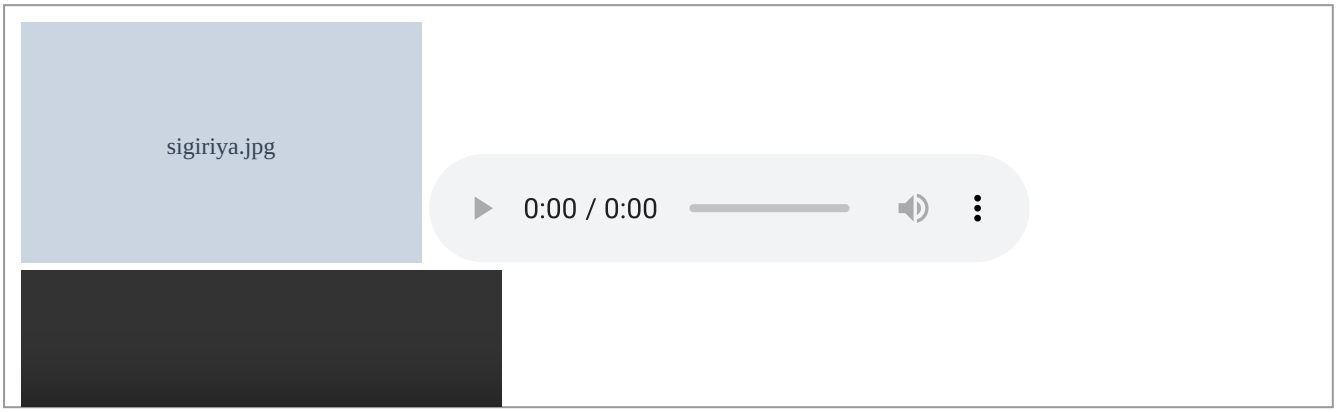
🧱 **Worked example: How many cells are typed in each row of the timetable, and why?** Row 1 has **2** cells (Time + a colspan="2" cell). Row 2 has **3** (Morning with rowspan="2", ICT, Maths). Row 3 has only **2** (Physics, Chemistry) because “Morning” already fills its first column. Every row still covers **3 columns**.

4. Images and multimedia

HTML: Image, audio and video

```
<!DOCTYPE html>
<html>
<head>
  <title>Media</title>
</head>
<body>
  <img src="sigiriya.jpg" alt="Sigiriya rock" width="200" height="120">
  <audio controls>
    <source src="anthem.mp3" type="audio/mpeg">
    Your browser does not support audio.
  </audio>
  <video width="240" height="140" controls>
    <source src="lesson.mp4" type="video/mp4">
    Your browser does not support video.
  </video>
</body>
</html>
```

▶ **Result in the browser**



- <img src alt width height> – alt text is read by screen readers and shown if the image is missing.
- <audio controls> and <video controls> with <source src type> play sound and video in HTML5.

💡 Use relative paths (news.html, images/logo.png) for local links so the site still works after uploading.

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* Modern pages add loading="lazy" to images and offer WebP or AVIF files, which are much smaller than JPEG.

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Key Words

Hypertext – Text that contains links to other text.

Anchor tag – The a tag that creates a hyperlink.

href – Attribute giving the link destination.

Bookmark – Link to a place in the same page using #id.

Local link – Link to another page of the same website.

External link – Link to a page on a different website.

Ordered list – Numbered list made with ol.

Unordered list – Bulleted list made with ul.

Definition list – List of terms and descriptions made with dl.

Table row – tr element that holds cells.

colspan – Attribute that merges cells across columns.

rowspan – Attribute that merges cells down rows.

Sample Q&A

1. Three kinds of hyperlink?

> **Answer:** Bookmark, local link, external link.

2. href for a bookmark to id="contact"?

> **Answer:** #contact.

3. ol vs ul?

> **Answer:** ol is numbered; ul has bullets.

4. th vs td?

> **Answer:** th is a header cell (bold, centred); td is a data cell.

5. Cells typed in row 3 of the timetable?

> **Answer:** 2 – rowspan fills the first column.

6. Why use alt in img?

> **Answer:** Accessibility and text if the image is missing.

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MCQ

1. A link with href="#contact" is a

A. external link
B. broken link
C. bookmark
D. e-mail link
E. local link to a file

2. href="news.html" is a

A. local link
B. external link
C. image
D. bookmark
E. style sheet

3. A numbered list uses

A.
B. <dl>
C. <dt>
D. only
E.

4. In a definition list the term is written in

A.
B. <dt>
C. <td>
D. <th>
E. <dd>

5. A header cell in a table is

A. <thead> only
B. <td>
C. <th>
D. <tr>
E. <caption>

6. The timetable table covers how many columns?

A. 4
B. 6
C. 5
D. 3
E. 2

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7. Cells typed in row 3 of the timetable are

A. 1
B. 4
C. 0
D. 2
E. 3

8. The attribute that plays video with buttons is

A. autoplay only
B. controls
C. alt
D. href
E. colspan

9. Which term means: “Text that contains links to other text”?

A. Unordered list
B. External link
C. href
D. colspan
E. Hypertext

10. Which term means: “The a tag that creates a hyperlink”?

A. Anchor tag
B. Bookmark
C. rowspan
D. Definition list
E. Ordered list

11. Which term means: “Attribute giving the link destination”?

A. Unordered list
B. href
C. Hypertext
D. Local link
E. Table row

12. Which term means: “Link to a place in the same page using #id”?

A. colspan
B. External link
C. Bookmark
D. Anchor tag
E. Definition list

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13. Which term means: “Link to another page of the same website”?

A. Ordered list
B. Table row
C. href
D. rowspan
E. Local link

14. Which term means: “Link to a page on a different website”?

A. External link
B. Unordered list
C. colspan
D. Hypertext
E. Bookmark

15. Which term means: “Numbered list made with ol”?

A. rowspan
B. Anchor tag
C. Local link
D. Ordered list
E. Definition list

16. Which term means: “Bulleted list made with ul”?

A. External link
B. href
C. Table row
D. Unordered list
E. Hypertext

17. Which term means: “List of terms and descriptions made with dl”?

A. Bookmark
B. Ordered list
C. colspan
D. Anchor tag
E. Definition list

18. Which term means: “tr element that holds cells”?

A. rowspan
B. Table row
C. Unordered list
D. href
E. Local link

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19. Which term means: “Attribute that merges cells across columns”?

A. Hypertext
B. Definition list
C. colspan
D. External link
E. Bookmark

20. Which term means: “Attribute that merges cells down rows”?

A. rowspan
B. Ordered list
C. Anchor tag
D. Local link
E. Table row

Structured Questions

1. Explain the three kinds of hyperlinks with HTML. *(4 marks)*

> #id; file.html; https://...; example code.

2. Write HTML for an ordered, an unordered and a definition list. *(3 marks)*

> ol li; ul li; dl dt dd.

3. Write HTML for a 3 × 3 table with a caption and one colspan. *(5 marks)*

> table; caption; tr; th colspan="2"; td.

4. Explain colspan and rowspan using the timetable. *(3 marks)*

> Subjects spans 2 columns; Morning spans 2 rows; row 3 has 2 cells.

5. Write HTML to add an image, an audio clip and a video. *(3 marks)*

> img src alt; audio controls source; video controls source.

Summary

- a href makes hyperlinks.
- Bookmark, local and external links.
- ol, ul and dl make lists.
- table, tr, th, td, caption make tables; colspan and rowspan merge.
- img, audio and video add multimedia.

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MCQ answer key – 10.4

1. **C** – Same page.
2. **A** – Same site.
3. **E** – Ordered.
4. **B** – dt.
5. **C** – th.
6. **D** – Colspan 2 + 1.
7. **D** – rowspan above.
8. **B** – controls.
9. **E** – Hypertext – Text that contains links to other text.
10. **A** – Anchor tag – The a tag that creates a hyperlink.
11. **B** – href – Attribute giving the link destination.
12. **C** – Bookmark – Link to a place in the same page using #id.
13. **E** – Local link – Link to another page of the same website.
14. **A** – External link – Link to a page on a different website.
15. **D** – Ordered list – Numbered list made with ol.
16. **D** – Unordered list – Bulleted list made with ul.
17. **E** – Definition list – List of terms and descriptions made with dl.
18. **B** – Table row – tr element that holds cells.
19. **C** – colspan – Attribute that merges cells across columns.
20. **A** – rowspan – Attribute that merges cells down rows.

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Grade 13 A/L ICT · Lesson 10

10.5 Cascading Style Sheets (CSS)

Syllabus 10.5. A **style sheet** controls how a page looks, keeping **content** (HTML) separate from **appearance** (CSS). A CSS **rule** has a **selector** and **declarations** property: value;. Selectors pick **elements**, an **id**, a **class** or a **group**. CSS can be inserted **inline**, **internally** in <style> or from an **external** .css file, and formats **backgrounds**, **text and fonts**, **links**, **lists** and **tables**.

1. CSS syntax

Anatomy of a CSS rule

```
h1 { color : navy ; }
```

selector | property | value | declaration ends ;

Comments: /* like this */ · several declarations go inside one { }

Selector, property and value

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2. Selectors and internal / inline CSS

HTML: CSS selectors, internal and inline styles

```
<!DOCTYPE html>
<html>
<head>
  <title>CSS demo</title>
  <style>
    /* element selector */
    p { color: black; font-family: Arial, sans-serif; }
    /* class selector */
    .tip { color: green; }
    /* id selector */
    #note { color: red; }
    /* group selector */
    h1, h2 { color: navy; text-align: center; }
    body { background-color: #eef6ff; }
    a:hover { color: orange; }
    ul { list-style-type: circle; }
    td { border: 1px solid gray; padding: 4px; }
  </style>
</head>
<body>
  <h1>CSS demo</h1>
  <p>Plain paragraph</p>
  <p class="tip">Class tip</p>
  <p id="note" class="tip">Id beats class</p>
  <p class="tip" style="color: purple;">Inline beats all</p>
</body>
</html>
```

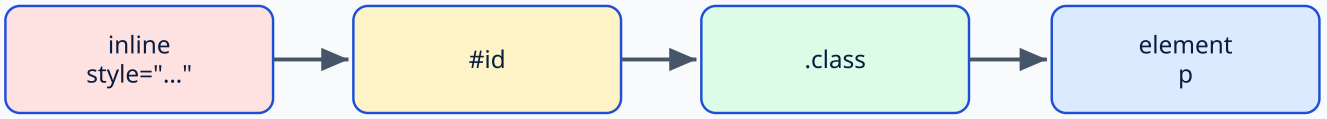
▶ **Result in the browser**



Selector	Example	Selects
Element	p { … }	Every p element
Class	.tip { … }	Elements with class="tip" (many allowed)
Id	#note { … }	The one element with id="note"
Group	h1, h2 { … }	Several selectors share one rule

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Which style wins? (highest first)



Same priority: the rule written later wins. External, internal and inline styles all join the cascade.

Priority when rules conflict

🧱 **Worked example: What colour is each paragraph in the demo?**
Plain paragraph: **black** (element rule). “Class tip”: **green** (class beats element). “Id beats class”: **red** – it has both class="tip" and id="note", and the id selector is stronger. “Inline beats all”: **purple** – an inline style attribute wins over the internal style sheet. The headings are **navy** from the group selector h1, h2.

3. External style sheet

HTML: Linking an external style sheet

```
<!DOCTYPE html>
<html>
<head>
  <title>External CSS</title>
  <link rel="stylesheet" href="style.css">
</head>
<body>
  <h1>Welcome</h1>
  <p>This page is styled by style.css.</p>
</body>
</html>
```

▶ **Result in the browser**

Welcome

This page is styled by style.css.

style.css

```
/* style.css — one file styles every page */
body { background-color: #fffbe6; font-family: Verdana, sans-serif; }
h1 { color: #b45309; font-size: 28px; }
p { font-size: 16px; line-height: 1.5; }
a:link { color: blue; }
a:visited { color: purple; }
table { border-collapse: collapse; }
th { background-color: #0b1d3f; color: white; }
```

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Method	How	Best use
Inline	style="color: purple;"	One element only
Internal	<style> in the head	One page
External	<link rel="stylesheet" href="style.css">	Many pages share one look

- Background: background-color, background-image: url("bg.png").
- Text and fonts: color, font-family, font-size, font-weight, text-align.
- Links: a:link, a:visited, a:hover, a:active.
- Lists: list-style-type (circle, square, decimal); tables: border, border-collapse, padding.
- Comments in CSS are written /* like this */.

💡 Use classes for styles you repeat and an id only for one unique element.

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* 2026 CSS includes Flexbox, Grid, variables (--main: navy) and media queries, so one page fits phones and desktops.

Key Words

CSS – Cascading Style Sheets that set the look of web pages.

Rule – Selector followed by declarations in braces.

Selector – Part of a rule that chooses the elements to style.

Declaration – Property and value pair ending in a semicolon.

Property – Feature to change such as color.

Class selector – Dot selector that styles every element with that class.

Id selector – Hash selector for one unique element.

Group selector – Comma-separated selectors that share a rule.

Inline style – CSS written in a style attribute of one element.

Internal style sheet – CSS in a style tag in the head.

External style sheet – Separate .css file linked to many pages.

Cascade – Rules that decide which style wins in a conflict.

Sample Q&A

1. Why use CSS?

Answer: Separate content from appearance; one change styles many pages.

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2. Class vs id selector?

> **Answer:** Class (.name) for many elements; id (#name) for one.

3. Colour of the id="note" paragraph?

> **Answer:** Red.

4. Three ways to insert CSS?

> **Answer:** Inline, internal, external.

5. How is an external sheet linked?

> **Answer:** <link rel="stylesheet" href="style.css"> in the head.

6. How are CSS comments written?

> **Answer:** /* comment */.

MCQ

1. In h1 { color: navy; } the selector is

A. h1
B. ;
C. navy
D. color
E. { }

2. A class selector starts with

A. a dot (.)
B. an at sign (@)
C. a comma (,)
D. a hash (#)
E. a colon (:)

3. An id selector starts with

A. a star (*)
B. a hash (#)
C. a colon (:)
D. a dot (.)
E. a slash (/)

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4. In the demo the id="note" paragraph is

A. green
B. purple
C. black
D. navy
E. red

5. In the demo the paragraph with an inline style is

A. navy
B. purple
C. green
D. black
E. red

6. h1, h2 { color: navy; } uses a

A. group selector
B. class selector
C. pseudo-class only
D. id selector
E. inline style

7. One .css file shared by many pages is

A. a bookmark
B. an external style sheet
C. an internal style sheet
D. a comment
E. an inline style

8. The colour of a link under the mouse is set with

A. a:link
B. a.mouse
C. a:hover
D. a:first
E. a:visited

9. Which term means: “Cascading Style Sheets that set the look of web pages”?

A. Selector
B. External style sheet
C. Class selector
D. CSS
E. Group selector

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10. Which term means: “Selector followed by declarations in braces”?

A. Inline style
B. Cascade
C. Rule
D. Id selector
E. Declaration

11. Which term means: “Part of a rule that chooses the elements to style”?

A. Internal style sheet
B. Property
C. Group selector
D. Selector
E. CSS

12. Which term means: “Property and value pair ending in a semicolon”?

A. Class selector
B. Declaration
C. External style sheet
D. Inline style
E. Rule

13. Which term means: “Feature to change such as color”?

A. Id selector
B. Selector
C. Cascade
D. Property
E. Internal style sheet

14. Which term means: “Dot selector that styles every element with that class”?

A. Declaration
B. Group selector
C. External style sheet
D. CSS
E. Class selector

15. Which term means: “Hash selector for one unique element”?

A. Property
B. Cascade
C. Id selector
D. Rule
E. Inline style

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16. Which term means: “Comma-separated selectors that share a rule”?

A. Selector
B. Class selector
C. Group selector
D. Internal style sheet
E. CSS

17. Which term means: “CSS written in a style attribute of one element”?

A. Rule
B. Declaration
C. Id selector
D. External style sheet
E. Inline style

18. Which term means: “CSS in a style tag in the head”?

A. Internal style sheet
B. Cascade
C. Selector
D. Group selector
E. Property

19. Which term means: “Separate .css file linked to many pages”?

A. Declaration
B. Inline style
C. CSS
D. Class selector
E. External style sheet

20. Which term means: “Rules that decide which style wins in a conflict”?

A. Rule
B. Property
C. Id selector
D. Cascade
E. Internal style sheet

Structured Questions

1. Explain the parts of a CSS rule. *(5 marks)*

> Selector; braces; property; value; semicolon.

2. Compare element, class, id and group selectors with examples. *(4 marks)*

> p; .tip; #note; h1, h2.

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3. Explain inline, internal and external CSS and when to use each. *(4 marks)*

> style attribute; style tag; link file; uses.

4. State the colour of each paragraph in the demo and explain. *(4 marks)*

> black; green; red (id); purple (inline).

5. Write CSS to style links, a list and a table. *(3 marks)*

> a:link/hover; ul list-style-type; table border-collapse, td padding.

Summary

- CSS separates appearance from content.
- A rule is selector { property: value; }.
- Element, class, id and group selectors.
- Inline, internal and external CSS.
- Inline > id > class > element.

MCQ answer key – 10.5

1. **A** – h1.
2. **A** – Dot.
3. **B** – Hash.
4. **E** – Id beats class.
5. **B** – Inline wins.
6. **A** – Group.
7. **B** – External.
8. **C** – Hover.
9. **D** – CSS – Cascading Style Sheets that set the look of web pages.
10. **C** – Rule – Selector followed by declarations in braces.
11. **D** – Selector – Part of a rule that chooses the elements to style.
12. **B** – Declaration – Property and value pair ending in a semicolon.
13. **D** – Property – Feature to change such as color.
14. **E** – Class selector – Dot selector that styles every element with that class.
15. **C** – Id selector – Hash selector for one unique element.
16. **C** – Group selector – Comma-separated selectors that share a rule.
17. **E** – Inline style – CSS written in a style attribute of one element.
18. **A** – Internal style sheet – CSS in a style tag in the head.
19. **E** – External style sheet – Separate .css file linked to many pages.
20. **D** – Cascade – Rules that decide which style wins in a conflict.

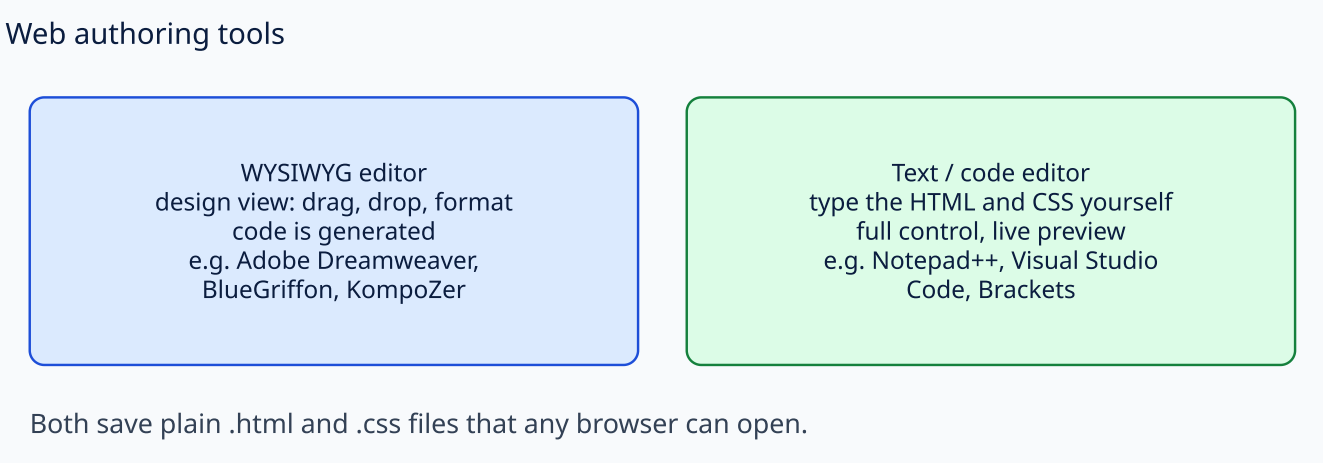
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10.6 Web Authoring Tools

Syllabus 10.6. A **web authoring tool** is software for creating web pages. **WYSIWYG** ("What You See Is What You Get") editors let you design visually while the tool writes the HTML; **text/code editors** let you type the code yourself with colouring and preview. Both save ordinary .html and .css files.

1. Two kinds of tools



WYSIWYG and code editors

Feature	WYSIWYG editor	Code editor
How you work	Drag, drop and format in design view	Type HTML/CSS tags
HTML knowledge needed	Little	Good
Control of code	Less – extra code may be added	Full
Examples	Adobe Dreamweaver (design view), BlueGriffon, KompoZer	Notepad++, Visual Studio Code, Brackets

2. Common features

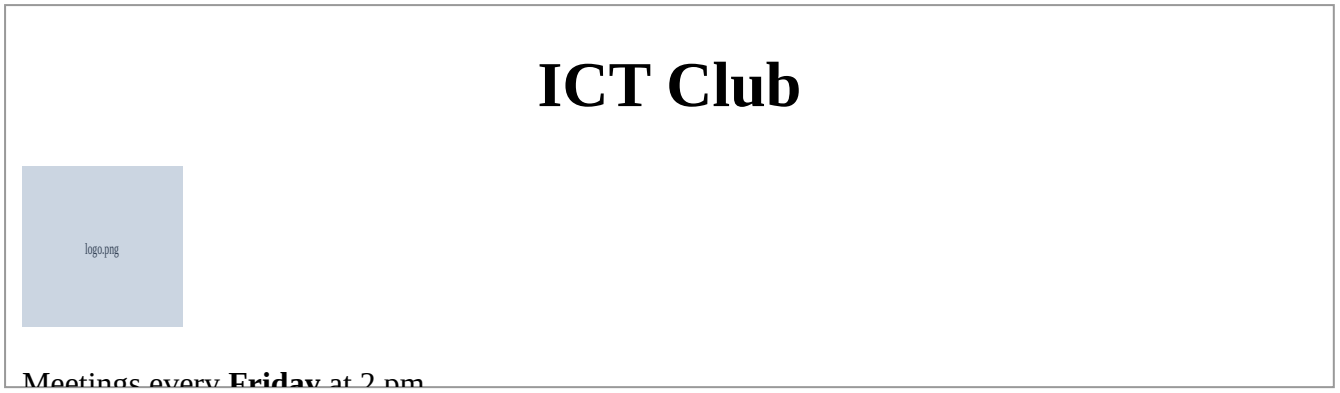
- Design, code and split views; live preview in a browser.
- Syntax colouring, auto-complete and tag closing.
- Insert menus for images, tables, links, forms and media.
- Site management and FTP upload to a web server (Lesson 10.8).

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HTML: Code produced by a WYSIWYG authoring tool

```
<!DOCTYPE html>
<html>
<head>
  <title>Club page</title>
</head>
<body>
  <h1 style="text-align: center;">ICT Club</h1>
  <p><img src="logo.png" alt="Club logo" width="80" height="80"></p>
  <p>Meetings every <strong>Friday</strong> at 2 pm.</p>
</body>
</html>
```

▶ **Result in the browser**



🧱 **Worked example: A WYSIWYG tool produced the code above. Name two tags it generated for formatting and say what they do.**
style="text-align: center;" inside <h1> **centres** the heading (an inline style), and makes “Friday” **bold**. The <img> with alt, width and height came from the Insert Image dialog.

💡 Even with a WYSIWYG tool, open the code view to check and clean the HTML – examiners expect you to read code.

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* In 2026 AI assistants inside editors such as VS Code can draft a page from a sentence, and site builders like WordPress use block editors – but you still need HTML and CSS to fix the result.

Key Words

Web authoring tool – Software used to create web pages.

WYSIWYG – What You See Is What You Get visual editing.

Code editor – Editor where you type HTML and CSS yourself.

Design view – Visual view showing the page as it will look.

Code view – View that shows the HTML source.

Split view – Design and code shown side by side.

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Syntax colouring – Showing tags and values in different colours.

Auto-complete – Editor suggests and finishes tags as you type.

Live preview – Browser view that updates as you edit.

Template – Ready-made page layout to reuse.

Source code – The HTML and CSS text of a page.

Text editor – Simple program for plain text such as Notepad.

Sample Q&A

1. What is WYSIWYG?

> **Answer:** What You See Is What You Get – visual design.

2. One advantage of WYSIWYG?

> **Answer:** No need to know much HTML; fast.

3. One disadvantage of WYSIWYG?

> **Answer:** Less control; extra code.

4. Two code editors?

> **Answer:** Notepad++, Visual Studio Code.

5. What does split view show?

> **Answer:** Design and code side by side.

6. File types saved?

> **Answer:** .html and .css.

MCQ

1. WYSIWYG stands for

A. World Wide Software Is Web
B. What You See Is What You Get
C. Write Your Site In Web Graphics
D. Web Your Site In Your Grid
E. What You Save Is What You Generate

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2. Which is a code editor?

A. File Explorer
B. Calculator
C. Windows Media Player
D. Microsoft Paint
E. Visual Studio Code

3. Which is a WYSIWYG web tool?

A. Notepad
B. Python IDLE
C. Task Manager
D. BlueGriffon
E. Command Prompt

4. Design and code shown side by side is

A. full screen
B. code view
C. split view
D. print view
E. design view

5. The tool code used to centre the heading is

A. style="text-align: center;"
B. only
C. <b>
D. text-indent
E. align="middle" on body

6. in the tool code makes text

A. underlined
B. a link
C. bold
D. italic
E. larger heading

7. A main disadvantage of WYSIWYG tools is

A. less control over the code
B. they need PHP
C. no visual design
D. they only make images
E. they cannot save files

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8. Editors that suggest tags while typing provide

A. FTP
B. compiling
C. encryption
D. DNS
E. auto-complete

9. Which term means: “Software used to create web pages”?

A. Split view
B. Source code
C. Auto-complete
D. Web authoring tool
E. Code editor

10. Which term means: “What You See Is What You Get visual editing”?

A. Syntax colouring
B. Live preview
C. Design view
D. Text editor
E. WYSIWYG

11. Which term means: “Editor where you type HTML and CSS yourself”?

A. Web authoring tool
B. Code editor
C. Code view
D. Auto-complete
E. Template

12. Which term means: “Visual view showing the page as it will look”?

A. Design view
B. Source code
C. Split view
D. Live preview
E. WYSIWYG

13. Which term means: “View that shows the HTML source”?

A. Text editor
B. Code view
C. Code editor
D. Template
E. Syntax colouring

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14. Which term means: “Design and code shown side by side”?

A. Auto-complete
B. Web authoring tool
C. Split view
D. Design view
E. Source code

15. Which term means: “Showing tags and values in different colours”?

A. Code view
B. WYSIWYG
C. Live preview
D. Syntax colouring
E. Text editor

16. Which term means: “Editor suggests and finishes tags as you type”?

A. Auto-complete
B. Code editor
C. Web authoring tool
D. Split view
E. Template

17. Which term means: “Browser view that updates as you edit”?

A. Source code
B. WYSIWYG
C. Live preview
D. Syntax colouring
E. Design view

18. Which term means: “Ready-made page layout to reuse”?

A. Auto-complete
B. Template
C. Code view
D. Code editor
E. Text editor

19. Which term means: “The HTML and CSS text of a page”?

A. Web authoring tool
B. Split view
C. Design view
D. Source code
E. Live preview

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20. Which term means: “Simple program for plain text such as Notepad”?

A. Code view
B. WYSIWYG
C. Syntax colouring
D. Template
E. Text editor

Structured Questions

1. Compare WYSIWYG editors and code editors. *(4 marks)*

> Visual vs typed; HTML knowledge; control; examples.

2. List four features of a web authoring tool. *(5 marks)*

> Views; syntax colouring; insert menus; preview; FTP.

3. Explain why you should still learn HTML when using a WYSIWYG tool. *(4 marks)*

> Fix errors; clean code; exams; control.

4. Describe how to create a page with an image using an authoring tool. *(6 marks)*

> New page; type heading; Insert > Image; alt; save .html; preview.

5. Read the generated code and explain each line. *(4 marks)*

> title; centred h1; img with alt; strong.

Summary

- Authoring tools create web pages.
- WYSIWYG: design visually.
- Code editors: type the code.
- Views, colouring, insert menus and preview help.
- Both save .html and .css files.

MCQ answer key – 10.6

1. **B** – WYSIWYG.
2. **E** – VS Code.
3. **D** – BlueGriffon.
4. **C** – Split.
5. **A** – Inline style.
6. **C** – Bold.
7. **A** – Less control.

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8. **E** – Auto-complete.
9. **D** – Web authoring tool – Software used to create web pages.
10. **E** – WYSIWYG – What You See Is What You Get visual editing.
11. **B** – Code editor – Editor where you type HTML and CSS yourself.
12. **A** – Design view – Visual view showing the page as it will look.
13. **B** – Code view – View that shows the HTML source.
14. **C** – Split view – Design and code shown side by side.
15. **D** – Syntax colouring – Showing tags and values in different colours.
16. **A** – Auto-complete – Editor suggests and finishes tags as you type.
17. **C** – Live preview – Browser view that updates as you edit.
18. **B** – Template – Ready-made page layout to reuse.
19. **D** – Source code – The HTML and CSS text of a page.
20. **E** – Text editor – Simple program for plain text such as Notepad.

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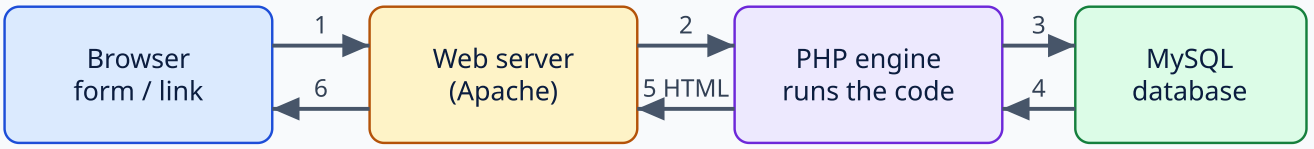
Grade 13 A/L ICT · Lesson 10

10.7 Dynamic Web Pages with PHP and MySQL

Syllabus 10.7. A **static page** shows the same HTML to everyone; a **dynamic page** is built by the server each time, often from a database. **PHP** code is embedded in HTML between <?php and ?>, runs on the **web server** and sends only HTML to the browser. You use **variables**, **arrays**, **control structures** and **functions**, collect input with **forms** and save or retrieve data in a **MySQL** database.

1. How PHP works

How a dynamic PHP page is built



1 request (GET/POST) · 2 run .php file · 3 SQL query · 4 rows back · 5 HTML · 6 page shown

The browser never sees PHP code – only the HTML that PHP prints with echo.

Browser, server, PHP and MySQL

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2. PHP basics

PHP: Variables, arrays, control structures and a function

```
<html><body>
<?php
$school = "Green Valley";            // variable
$marks = array(78, 45, 88);          // indexed array
$total = 0;
foreach ($marks as $m) {             // loop
    $total = $total + $m;
}
$avg = $total / count($marks);

function grade($mark) {              // user-defined function
    if ($mark >= 75) {
        return "A";
    } elseif ($mark >= 50) {
        return "C";
    } else {
        return "F";
    }
}

echo "<h2>" . $school . "</h2>";
echo "<p>Total: $total, Average: " . round($avg, 1) . "</p>";
for ($i = 0; $i < count($marks); $i++) {
    echo "<p>" . $marks[$i] . " = " . grade($marks[$i]) . "</p>";
}
$student = array("name" => "Nimal", "stream" => "Tech");   // associative array
echo "<p>" . $student["name"] . " (" . $student["stream"] . ")</p>";
?>
</body></html>
```

▶ HTML sent to the browser

```
<html><body>
<h2>Green Valley</h2><p>Total: 211, Average: 70.3</p><p>78 = A</p><p>45 = F</p><p>88 = A</p>
<p>Nimal (Tech)</p></body></html>
```

🧱 **Worked example: Explain the output of the basics program.**

foreach adds 78 + 45 + 88 = **211**; the average 211 ÷ 3 = 70.33… is rounded to **70.3**. The for loop calls grade() for each mark: 78 → **A**, 45 → **F**, 88 → **A**. The associative array gives “Nimal (Tech)”. Variables start with $, statements end with ; and the . operator joins strings.

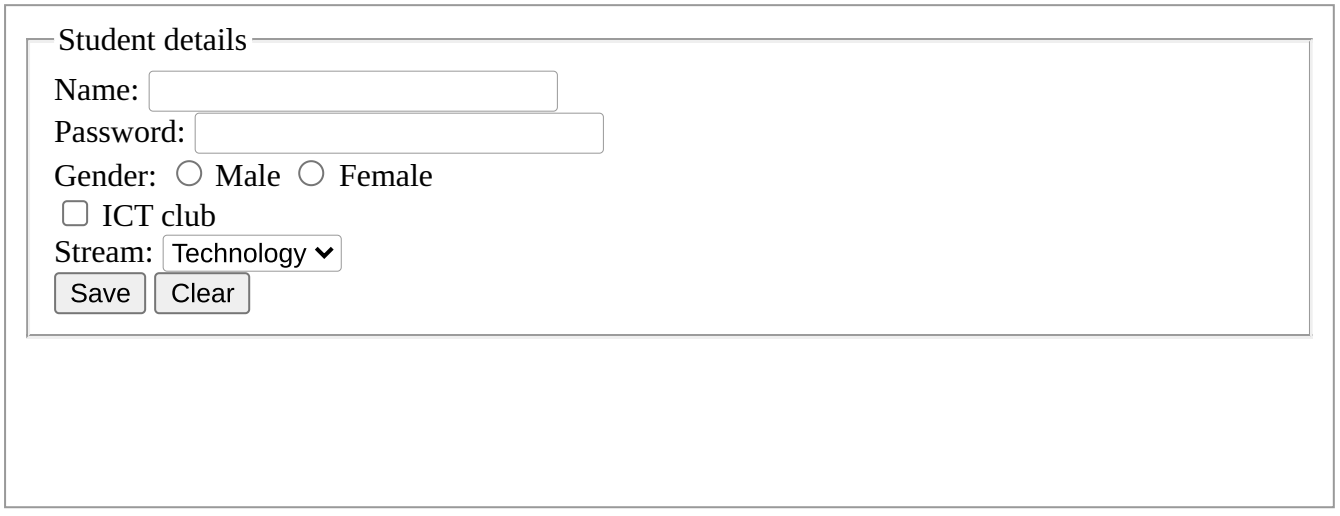
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3. Forms

HTML: A registration form

```
<!DOCTYPE html>
<html>
<head>
  <title>Register</title>
</head>
<body>
  <form action="save.php" method="post">
    <fieldset>
      <legend>Student details</legend>
      Name: <input type="text" name="name" value=""><br>
      Password: <input type="password" name="pwd"><br>
      Gender:
      <input type="radio" name="gender" value="M"> Male
      <input type="radio" name="gender" value="F"> Female<br>
      <input type="checkbox" name="club" value="ICT"> ICT club<br>
      Stream:
      <select name="stream">
        <option value="Tech">Technology</option>
        <option value="Sci">Science</option>
      </select><br>
      <input type="submit" value="Save">
      <input type="reset" value="Clear">
    </fieldset>
  </form>
</body>
</html>
```

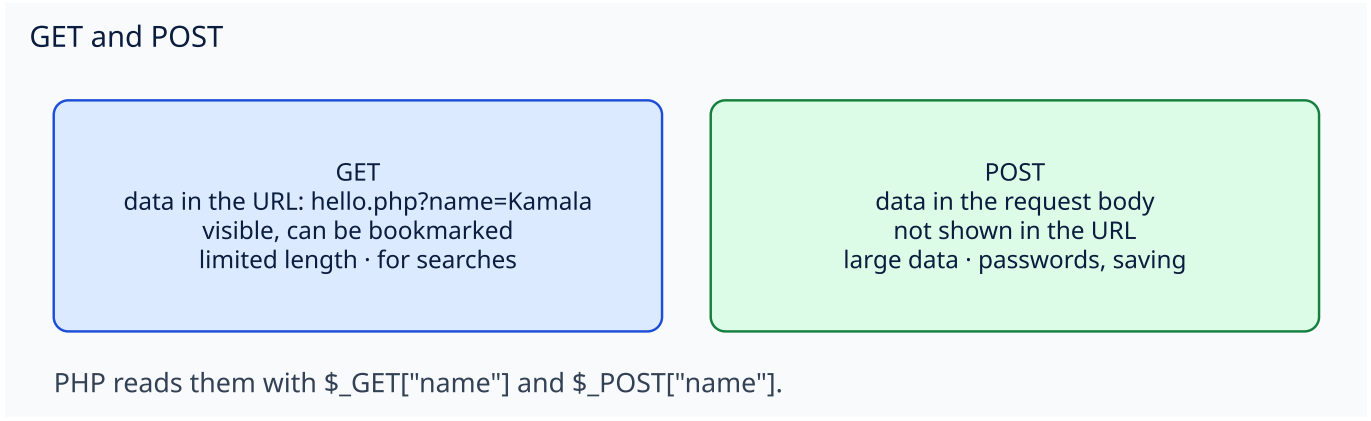
▶ **Result in the browser**



Element	Use
<input type="text" name="name" value="">	One line of text; name is the key PHP reads, value the default text
type="password"	Text shown as dots
type="radio"	Choose one of a group with the same name
type="checkbox"	Tick any number of options
<select><option>	Drop-down selection list

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type="submit" / type="reset"	Send the form / clear it
action="save.php" method="post"	Where and how the data is sent
<fieldset><legend>	Groups related fields with a caption



GET and POST methods

PHP: Reading a value sent with GET

```
<?php
// hello.php?name=Kamala
$name = $_GET["name"];
echo "<p>Hello, " . htmlspecialchars($name) . "!</p>";
?>
```

▶ HTML sent to the browser

```
<p>Hello, Kamala!</p>
```

4. Working with a MySQL database

Creating the data source: table student and its rows (SQL)

```
CREATE TABLE student (id INTEGER PRIMARY KEY, name VARCHAR(40), stream VARCHAR(10), mark
INT);
INSERT INTO student VALUES (1, 'Nimal', 'Tech', 78);
INSERT INTO student VALUES (2, 'Kamala', 'Sci', 45);
INSERT INTO student VALUES (3, 'Sunil', 'Tech', 88);
```

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PHP: save.php – saving form data into the database

```
<?php
$db = new PDO("mysql:host=localhost;dbname=school", "root", "");
if ($_SERVER["REQUEST_METHOD"] == "POST") {
    $name = $_POST["name"];
    $stream = $_POST["stream"];
    $sql = "INSERT INTO student (name, stream, mark) VALUES (?, ?, ?)";
    $stmt = $db->prepare($sql);
    $stmt->execute(array($name, $stream, 0));
    echo "<p>Saved " . $stmt->rowCount() . " record for " . htmlspecialchars($name) . ".</p>";
}
$count = $db->query("SELECT COUNT(*) FROM student")->fetchColumn();
echo "<p>Students now: $count</p>";
?>
```

▶ **HTML sent to the browser**

```
<p>Saved 1 record for Amali.</p><p>Students now: 4</p>
```

PHP: list.php – retrieving data into an HTML table

```
<?php
$db = new PDO("mysql:host=localhost;dbname=school", "root", "");
$result = $db->query("SELECT id, name, mark FROM student WHERE stream = 'Tech' ORDER BY mark
DESC");
echo "<table border=\"1\">";
echo "<tr><th>ID</th><th>Name</th><th>Mark</th></tr>";
foreach ($result as $row) {
    echo "<tr><td>" . $row["id"] . "</td><td>" . $row["name"] . "</td><td>" . $row["mark"] . "
</td></tr>";
}
echo "</table>";
?>
```

▶ **HTML sent to the browser**

```
<table border="1"><tr><th>ID</th><th>Name</th><th>Mark</th></tr><tr><td>3</td><td>Sunil</td>
<td>88</td></tr><tr><td>1</td><td>Nimal</td><td>78</td></tr></table>
```

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PHP: edit.php – setting form values from retrieved data

```
<?php
$db = new PDO("mysql:host=localhost;dbname=school", "root", "");
$stmt = $db->prepare("SELECT * FROM student WHERE id = ?");
$stmt->execute(array($_GET["id"]));
$row = $stmt->fetch();
?>
<form action="update.php" method="post">
  <input type="hidden" name="id" value="<?php echo $row["id"]; ?>">
  Name: <input type="text" name="name" value="<?php echo htmlspecialchars($row["name"]); ?>">
  Mark: <input type="text" name="mark" value="<?php echo $row["mark"]; ?>">
  <input type="submit" value="Update">
</form>
```

▶ **HTML sent to the browser**

```
<form action="update.php" method="post">
  <input type="hidden" name="id" value="2">
  Name: <input type="text" name="name" value="Kamala">
  Mark: <input type="text" name="mark" value="45">
  <input type="submit" value="Update">
</form>
```

🧱 **Worked example: What does each database program print, and why?**
save.php receives name=Amali by POST, runs a prepared INSERT and prints “Saved 1 record” – the table now has **4** students. list.php selects stream Tech ordered by mark DESC, so Sunil **88** comes before Nimal **78**. edit.php reads id=2 from the URL and puts **Kamala** and **45** into the value attributes, so the form opens already filled.

- Connect: new PDO("mysql:host=...;dbname=...", user, password) – or mysqli_connect() in older code.
- Use **prepared statements** with ? placeholders and htmlspecialchars() on output for security.
- These programs were run with PHP 8; for testing, the MySQL line was swapped for an SQLite database with the same table.

💡 View the page source in the browser: you will see only HTML – proof that PHP ran on the server.

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* In 2026 PHP 8 powers WordPress and Laravel sites; many apps also send JSON from PHP to JavaScript (fetch) instead of whole pages.

Key Words

Static web page – Page that shows the same content to every visitor.

Dynamic web page – Page built by the server each time it is requested.

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PHP – Server-side scripting language embedded in HTML.

Server-side script – Code that runs on the web server, not the browser.

Variable – Named value in PHP starting with a dollar sign.

Array – Variable that holds many values by index or key.

Associative array – Array that uses named keys such as name.

echo – PHP statement that outputs text or HTML.

Form – HTML element that collects user input.

GET method – Sends form data in the URL.

POST method – Sends form data in the request body.

Prepared statement – SQL with placeholders filled safely.

Sample Q&A

1. Static vs dynamic page?

> **Answer:** Static is fixed HTML; dynamic is built by the server each time.

2. Where does PHP run?

> **Answer:** On the web server.

3. Total and average in basics?

> **Answer:** 211 and 70.3.

4. GET vs POST?

> **Answer:** GET puts data in the URL; POST hides it in the body.

5. First row of list.php?

> **Answer:** 3, Sunil, 88.

6. What fills the edit form?

> **Answer:** The row id=2 – Kamala, 45 – in value attributes.

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MCQ

1. PHP code is written between

A. <% and %> only
B. <script> and </script>
C. <php> and </php>
D. <?php and ?>
E. {{ and }}

2. PHP runs on the

A. web server
B. browser
C. DNS server
D. printer
E. keyboard

3. The basics program prints Average

A. 70.0
B. 70.3
C. 211
D. 71
E. 70.33

4. grade(45) returns

A. A
B. B
C. F
D. C
E. 45

5. Which input type shows typed text as dots?

A. password
B. submit
C. hidden
D. radio
E. text

6. Choosing exactly one option from a group uses

A. check boxes
B. a fieldset
C. a reset button
D. radio buttons
E. a password box

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7. After save.php runs, the number of students is

A. 5
B. 3
C. 1
D. 0
E. 4

8. The first data row printed by list.php is

A. Amali 0
B. Nimal 78
C. Sunil 88
D. Nimal 88
E. Kamala 45

9. Which term means: “Page that shows the same content to every visitor”?

A. PHP
B. Static web page
C. Array
D. POST method
E. echo

10. Which term means: “Page built by the server each time it is requested”?

A. Associative array
B. Form
C. Dynamic web page
D. Server-side script
E. Prepared statement

11. Which term means: “Server-side scripting language embedded in HTML”?

A. echo
B. GET method
C. Static web page
D. PHP
E. Variable

12. Which term means: “Code that runs on the web server, not the browser”?

A. POST method
B. Form
C. Dynamic web page
D. Array
E. Server-side script

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13. Which term means: “Named value in PHP starting with a dollar sign”?

A. PHP
B. Variable
C. Associative array
D. Prepared statement
E. GET method

14. Which term means: “Variable that holds many values by index or key”?

A. Static web page
B. echo
C. POST method
D. Server-side script
E. Array

15. Which term means: “Array that uses named keys such as name”?

A. Variable
B. Associative array
C. Dynamic web page
D. Form
E. Prepared statement

16. Which term means: “PHP statement that outputs text or HTML”?

A. echo
B. GET method
C. Static web page
D. PHP
E. Array

17. Which term means: “HTML element that collects user input”?

A. Server-side script
B. Associative array
C. Dynamic web page
D. Form
E. POST method

18. Which term means: “Sends form data in the URL”?

A. GET method
B. echo
C. PHP
D. Prepared statement
E. Variable

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19. Which term means: “Sends form data in the request body”?

A. Server-side script
B. Form
C. POST method
D. Static web page
E. Array

20. Which term means: “SQL with placeholders filled safely”?

A. Associative array
B. GET method
C. Dynamic web page
D. Variable
E. Prepared statement

Structured Questions

1. Distinguish static and dynamic web pages. *(3 marks)*

> Fixed vs built per request; example; database.

2. Write PHP that stores three marks in an array and prints the total and average. *(4 marks)*

> array; foreach; count; echo 211 and 70.3.

3. Write an HTML form with text, password, radio, checkbox, select, submit and reset. *(3 marks)*

> form action method; fieldset; each input type.

4. Compare GET and POST. *(4 marks)*

> URL vs body; visibility; size; uses.

5. Write PHP to save form data into MySQL and display all records. *(5 marks)*

> connect; $_POST; prepared INSERT; SELECT; loop echo table.

Summary

- Dynamic pages are built on the server.
- PHP sits in <?php ?> and echoes HTML.
- Variables, arrays, control structures, functions.
- Forms send data by GET or POST.
- PHP saves and retrieves MySQL data.

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MCQ answer key – 10.7

1. **D** – Tags.
2. **A** – Server-side.
3. **B** – 211 ÷ 3 rounded.
4. **C** – Below 50.
5. **A** – Password.
6. **D** – Radio.
7. **E** – 3 + 1.
8. **C** – ORDER BY mark DESC.
9. **B** – Static web page – Page that shows the same content to every visitor.
10. **C** – Dynamic web page – Page built by the server each time it is requested.
11. **D** – PHP – Server-side scripting language embedded in HTML.
12. **E** – Server-side script – Code that runs on the web server, not the browser.
13. **B** – Variable – Named value in PHP starting with a dollar sign.
14. **E** – Array – Variable that holds many values by index or key.
15. **B** – Associative array – Array that uses named keys such as name.
16. **A** – echo – PHP statement that outputs text or HTML.
17. **D** – Form – HTML element that collects user input.
18. **A** – GET method – Sends form data in the URL.
19. **C** – POST method – Sends form data in the request body.
20. **E** – Prepared statement – SQL with placeholders filled safely.

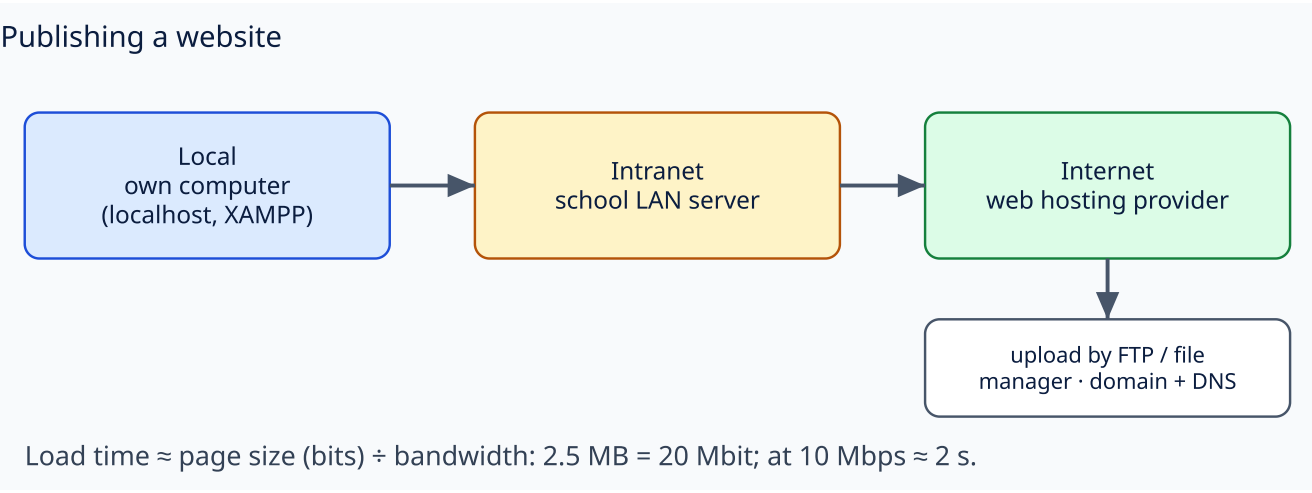
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Grade 13 A/L ICT · Lesson 10

10.8 Publishing and Maintaining Websites

Syllabus 10.8. Publishing means putting a website where users can open it. **Local publishing** uses your **own computer** (a local server such as XAMPP at http://localhost) or a school **intranet**. **Internet publishing** uses a **web hosting service provider**: you get space on a **web server**, upload the files and link a **domain name**. After publishing you **maintain** the site and watch the **factors that affect its performance**.

1. Ways to publish



Local, intranet and Internet publishing

Method	Who can see it	How
Own computer	Only you (testing)	Install a local server (XAMPP/WAMP); put files in htdocs; open http://localhost
Intranet	Users on the school or office network	Copy files to the LAN web server
Internet	Anyone in the world	Register with a host (free or paid); upload by FTP or file manager; set the domain

2. Publishing on the Internet – steps

- Test the site locally and check every link.
- Choose a web hosting service provider – free hosts give a sub-domain such as myschool.free-host.com.
- Register a domain name (e.g. .lk through LK Domain Registry) and point it to the host with DNS.
- Upload files with an FTP client (FileZilla) or the host's file manager; index.html is the home page.

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- Create the MySQL database on the host for PHP pages and update the connection settings.

3. Factors affecting performance

Factor	Effect
Page size (large images, video)	More data → slower loading
Bandwidth of the user and the server	Low bandwidth → slow
Server speed, load and location	Busy or distant servers respond slowly
Number of files and scripts	Each file is another request
Browser and device	Old devices render slowly

🧱 **Worked example: A page is 2.5 MB and the user has 10 Mbps. Estimate the load time, then the time after a 1.8 MB image is compressed to 0.5 MB.**
2.5 MB × 8 = 20.0 Mbit; 20.0 ÷ 10 = **2.0 s**. New size 2.5 − 1.8 + 0.5 = 1.2 MB = 9.6 Mbit, so about **0.96 s** – the page loads twice as fast.

- **Maintenance**: update content, fix broken links, back up files and database, renew the domain and check security updates.

💡 1 byte = 8 bits: always multiply MB by 8 before dividing by a speed in Mbps.

🚀 **Beyond the syllabus (2026 update)** *Not required for the exam – read for interest.* In 2026 many sites are published free from Git with services such as GitHub Pages or Netlify and served through a CDN close to the user.

Key Words

Publishing – Making a website available to its users.

Local publishing – Running a site on your own computer or intranet.

localhost – Name of your own computer as a web server.

Intranet – Private network inside an organisation.

Web hosting – Service that stores a site on a server connected to the Internet.

Web hosting service provider – Company that rents web server space.

Free web hosting – Hosting at no cost, usually with a sub-domain and adverts.

FTP – File Transfer Protocol used to upload files.

Domain name – Name such as nie.lk that points to a server.

DNS – System that turns domain names into IP addresses.

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Bandwidth – Amount of data that can be sent per second.

Website maintenance – Keeping a site updated, working and secure.

Sample Q&A

1. Local vs Internet publishing?

> **Answer:** Local: own computer/intranet; Internet: hosting provider for everyone.

2. What is localhost?

> **Answer:** Your own computer acting as a web server.

3. How are files uploaded?

> **Answer:** By FTP or the host file manager.

4. Load time of 2.5 MB at 10 Mbps?

> **Answer:** 2.0 s.

5. Time after compressing the image?

> **Answer:** About 0.96 s.

6. Two maintenance tasks?

> **Answer:** Update content; fix broken links; backups.

MCQ

1. Running a site at http://localhost is

A. Internet publishing
B. intranet only
C. DNS
D. local publishing on your own computer
E. FTP

2. A school network that only staff and students reach is an

A. intranet
B. extranet only
C. Internet
D. portal
E. DNS

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3. Files are uploaded to a web host using

A. HTTP GET only
B. POP3
C. SMTP
D. FTP
E. DNS

4. Domain names are turned into IP addresses by

A. PHP
B. CSS
C. FTP
D. HTML
E. DNS

5. A 2.5 MB page at 10 Mbps loads in about

A. 25 s
B. 4 s
C. 0.25 s
D. 8 s
E. 2.0 s

6. After compressing the image, the page loads in about

A. 1.2 s
B. 4.6 s
C. 2 s
D. 0.96 s
E. 0.5 s

7. Which most reduces page loading time?

A. using a slower server
B. compressing large images
C. removing alt text
D. adding more files
E. adding more videos

8. The default home page file on most servers is

A. home.css
B. main.docx
C. start.php.txt
D. index.html
E. page1.jpg

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9. Which term means: “Making a website available to its users”?

A. Bandwidth
B. Web hosting service provider
C. Publishing
D. localhost
E. FTP

10. Which term means: “Running a site on your own computer or intranet”?

A. Intranet
B. Local publishing
C. Website maintenance
D. Free web hosting
E. Domain name

11. Which term means: “Name of your own computer as a web server”?

A. FTP
B. DNS
C. localhost
D. Publishing
E. Web hosting

12. Which term means: “Private network inside an organisation”?

A. Intranet
B. Bandwidth
C. Local publishing
D. Web hosting service provider
E. Domain name

13. Which term means: “Service that stores a site on a server connected to the Internet”?

A. DNS
B. Web hosting
C. localhost
D. Free web hosting
E. Website maintenance

14. Which term means: “Company that rents web server space”?

A. Web hosting service provider
B. Bandwidth
C. Intranet
D. Publishing
E. FTP

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15. Which term means: “Hosting at no cost, usually with a sub-domain and adverts”?

A. Website maintenance
B. Web hosting
C. Free web hosting
D. Domain name
E. Local publishing

16. Which term means: “File Transfer Protocol used to upload files”?

A. DNS
B. localhost
C. Web hosting service provider
D. Publishing
E. FTP

17. Which term means: “Name such as nie.lk that points to a server”?

A. Local publishing
B. Free web hosting
C. Domain name
D. Bandwidth
E. Intranet

18. Which term means: “System that turns domain names into IP addresses”?

A. Web hosting
B. DNS
C. FTP
D. localhost
E. Website maintenance

19. Which term means: “Amount of data that can be sent per second”?

A. Bandwidth
B. Intranet
C. Domain name
D. Web hosting service provider
E. Publishing

20. Which term means: “Keeping a site updated, working and secure”?

A. Free web hosting
B. Web hosting
C. Local publishing
D. DNS
E. Website maintenance

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Structured Questions

1. Compare local, intranet and Internet publishing. *(3 marks)*

> Own computer; LAN; hosting for everyone.

2. List the steps to publish a site through a free web host. *(5 marks)*

> Test; register; upload by FTP; check links; domain.

3. Explain four factors that affect website performance. *(5 marks)*

> Page size; bandwidth; server; number of files; device.

4. Calculate the load time of a 2.5 MB page at 10 Mbps and after compression. *(2 marks)*

> 2.5 × 8 = 20 Mbit ÷ 10 = 2 s; 1.2 MB → 0.96 s.

5. Explain why websites must be maintained. *(4 marks)*

> Up-to-date content; broken links; security; backups.

Summary

- Test locally with localhost.
- Intranet sites serve one organisation.
- Internet publishing uses a hosting provider and FTP.
- Size, bandwidth and server affect speed.
- Maintain content, links and security.

MCQ answer key – 10.8

1. **D** – Local.
2. **A** – Intranet.
3. **D** – FTP.
4. **E** – DNS.
5. **E** – 20 Mbit ÷ 10.
6. **D** – 1.2 MB = 9.6 Mbit.
7. **B** – Smaller files.
8. **D** – index.html.
9. **C** – Publishing – Making a website available to its users.
10. **B** – Local publishing – Running a site on your own computer or intranet.
11. **C** – localhost – Name of your own computer as a web server.
12. **A** – Intranet – Private network inside an organisation.
13. **B** – Web hosting – Service that stores a site on a server connected to the Internet.
14. **A** – Web hosting service provider – Company that rents web server space.
15. **C** – Free web hosting – Hosting at no cost, usually with a sub-domain and adverts.

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16. **E** – FTP – File Transfer Protocol used to upload files.
17. **C** – Domain name – Name such as nie.lk that points to a server.
18. **B** – DNS – System that turns domain names into IP addresses.
19. **A** – Bandwidth – Amount of data that can be sent per second.
20. **E** – Website maintenance – Keeping a site updated, working and secure.

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