

Chapter 7: Information Representation Method — XML

Solutions

Summative Assessment

Multiple-Choice Questions (MCQs)

1. XML was developed to overcome the limitations of the markup language.
- a. EDI b. SGML
c. HTML d. None of these

Ans. b

2. A is the software that validates a document of a markup language such as XML and SGML.
- a. DTD b. CSS
c. Parser d. None of these

Ans. c

3. XML is a subset of:
- a. EDI b. SGML
c. HTML d. None of these

Ans. b

4. PI is a component of:
- a. Prolog b. Data instance
c. Element d. Root element

Ans. a

5. Which of the following is not true about XML element?
- a. The name of the element can start with letters or the underscore (_) character, but not with numbers or punctuation characters.
b. Element names cannot contain spaces.
c. Element names cannot start with the word xml in any form (XML or Xml or xml).
d. None of these

Ans. c

6. Which of the following is not a special character?
- a. < b. &
c. @gt; d. "

Ans. c

7. Does the following code contain a prolog?
<Employees>

```
<FirstName>Ambrish</FirstName>
<LastName>Garg</LastName>
</Employees>
```

- a. Yes
b. No
c. Cannot be determined without the DTD.
d. None of these

Ans. c

8. The following code is a type of:

```
<?xml version="1.0"?>
<!DOCTYPE Email [
<!ELEMENT Email
(To,From,Subject,Body)>
<!ELEMENT To (#PCDATA)>
<!ELEMENT From (#PCDATA)>
<!ELEMENT Subject (#PCDATA)>
<!ELEMENT Body (#PCDATA)>
]>
```

- a. XML
b. DTD
c. HTML
d. Schema

Ans. b

Very Short Answer Questions

9. Explain the term 'extensible'.

Ans. The term extensible means that you can create your own tags or user-defined tags in the XML document.

10. What is an attribute?

Ans. An attribute is a property of an element, which provides additional information about the element.

11. Name a predefined markup language.

Ans. HTML is a predefined markup language.

12. What is an entity?

Ans. The storage unit that contains the actual data of an XML file is known as an entity.

Short Answer Questions

13. What is meta-language? Give two examples of meta-languages.

Ans. Meta-language is a type of language that is used to define and describe other markup languages. Two examples of meta-languages are XML and SGML.

14. Give an example where XML could be preferred over HTML.

Ans. XML is preferred in situations where you need to access specific information. Consider a situation in which you need to extract the zip code from the given address. In such cases, you need to use XML as HTML does not allow you to access any specific part of the text.

15. Explain the document element.

Ans. The root element is also known as the document element that contains all other elements in XML document. It means that all the elements are nested within the root element. In other words, you can say that the root element is the parent element for all other elements. An XML document must contain at least one element that will be a parent for all the other elements.

Consider the following example of a root element or document element:

```
<Employees>
<employee>
<FirstName>Ambrish</FirstName>
<LastName>Kohli</LastName>
</employee>
<employee>
<FirstName>Rahul</FirstName>
<LastName>Sharma</LastName>
</employee>
</Employees>
```

16. Give an example where HTML could be preferred over XML.

Ans. HTML focuses on appearance of data; whereas, XML focuses on data description. In cases where we need to prepare a Web document that contains Web pages with colorful backgrounds, well formatted text, attractive images, and embedded audios and videos, XML is preferred over HTML.

17. Write the name of the following statement:

```
<?xml version="1.0" encoding="utf-8" standalone="yes"?>
```

Ans. The `<?xml version="1.0" encoding="utf-8" standalone="yes"?>` statement is known as XML declaration.

Long Answer Questions

18. Mention five important features of XML.

Ans. XML is one of the most commonly used markup languages to present and exchange data. You can get an idea of the popularity of the language if you learn something about its features. The following are the salient features of XML:

- **Designed to describe data:** Implies that the focus of XML is on the description of data, not its presentation. HTML is designed to focus on the presentation of data.
- **Structured language:** Defines the structure of a document using tags. XML is a user-defined language, implying that it allows you to create your own tags.
- **Platform-independent:** Enables you to execute XML-based applications on any operating system.
- **Language-independent:** Implies that you can use XML with any other technology or language, such as Java, .NET, and Hypertext Preprocessor (PHP).
- **Extensible:** Creates user-defined tags. XML does not provide any predefined tags to structure your document. Rather, you have to create all the tags of the document.

19. What is a well-formed document?

Ans. A well-formed XML document is the one that follows XML guidelines and uses descriptive tags. In other words, an XML document is considered well-formed if all the tags follow XML guidelines and are in their proper places in the document. You need to keep the following guidelines in mind while creating a well-formed XML document:

- The document must contain at least one element
- Must have a root element
- Elements must contain the opening and closing tags
- Document must follow the correct tag order
- XML tags must be case-sensitive
- The values of the attributes must be in double quotes

20. What is a valid XML document?

Ans. A valid XML document is not only a well-formed document but also one that conforms to the DTD rules. DTD rules help in defining the structure of XML documents with a list of valid elements. The following code snippet shows an example of a DTD document:

```
<?xml version="1.0"?>
<!DOCTYPE email [
<!ELEMENT email (to, from, heading, body)>
<!ELEMENT to (#PCDATA)>
<!ELEMENT from (#PCDATA)>
<!ELEMENT heading (#PCDATA)>
<!ELEMENT body (#PCDATA)>
]>
```

As you can see in the preceding code, we have defined DTD rules for the structure of an XML document. We have defined email as a parent element, which contains the four child elements: to, from, heading, and body. #PCDATA implies that all these elements will be parsed by the XML parser.

21. 'A document may be well-formed but not valid.' Explain this statement.

Ans. In XML, a document is said to be well-formed if it follows XML guidelines and uses descriptive tags. In other words, an XML document is considered well-formed if all the tags follow XML guidelines and are in their proper places in the document. The following guidelines help in creating a well-formed XML document:

- The document must contain at least one element
- Must have a root element
- Elements must contain the opening and closing tags
- Document must follow the correct tag order
- XML tags must be case-sensitive
- The values of the attributes must be in double quotes

On the other hand, a valid XML document is not only a well-formed document but also one that conforms to the DTD rules. These rules help define the structure of XML documents with a list of valid elements.

22. Write the XML code to represent a sample mark sheet.

Ans.

```
<?xml version = "1.0" encoding = "utf-8"?>
<Student_MarksSheet>
<Student_Details>
<Stud_Name> Kavya </Stud_Name>
<Stud_Class> IX </Stud_Class>
<Stud_RollNo> 1101 </Stud_RollNo>
<Total_Marks> 268 </Total_Marks>
```

```
</Student_Details>
</Student_MarksSheet>
```

23. Create a stylesheet for an XML document for the mark sheet.

Ans. The style-sheet for an XML document for the mark sheet is shown as follows:

```
Student_Details
{
font-style: italic;
}
Stud_Name
{
color: Red; font-weight: bold;
}
Stud_Class
{
font-family: serif; font-weight: bold; color:
Green;
}
Stud_RollNo
{
font-size: 10pt; color: Brown;
}
Total_Marks
{
font-size: 10pt; font-family: serif; font-
weight: bold; color: Blue;
}
```

24. What do you understand by XML parser?

Ans. An XML parser is used to read, update, and manipulate XML documents. The XML parser is a small application that is part of bigger software, such as Oracle 11 and modern Web browsers. The parser reads the XML document and tests whether it is well-formed according to the given DTD or XML schema.

25. 'XML a data descriptive language.' Explain.

Ans. XML is a data descriptive language, which implies that you can create your own tags to describe the data according to your requirements. Therefore, you do not need any prior knowledge to create or understand these tags.

26. List the standards defined by W3C regarding XML.

Ans. The following are some standards defined by W3C, which need to be followed by all XML-based applications:

- XML must be directly usable over Internet.
- Almost all or a wide range of applications must be supported by XML.
- XML must be compatible with SGML.
- The number of optional features in XML should be zero or absolute.
- XML documents need to be clear and human-readable.
- XML structure must be formal and concise.

27. What do you understand by the XML document system? Explain with the help of a pictorial representation.

Ans. The XML document system is a combination of the following types of documents:

- **XML:** Refers to an XML document.
- **DTD:** Refers to the document that defines the structure and rules of an XML document. DTD is short for Document Type Definition.

- **Style-sheet:** Specifies the style (appearance) for the XML document. There are two types of style-sheets available in XML — Cascading Stylesheet (CSS) and Extensible Style-Sheet Language (XSL).

The XML document system is shown in Figure 1:

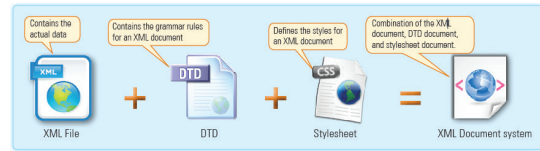


Figure 1: XML Document System

28. What is the use of the document type declaration? How is it different from DTD?

Ans. The document type declaration is used to specify a Document Type Definition (DTD) document that contains the grammar rules or guidelines for a particular class or section of the XML document. The document type declaration begins with the !DOCTYPE declaration. The following code snippet shows the use of document type declaration:

```
<!DOCTYPE Animals SYSTEM = "Anim.dtd">
```

On the other hand, DTD refers to the document that defines the structure and rules of an XML document. The following code snippet shows an example of a DTD document:

```
<?xml version="1.0"?>
<!DOCTYPE email [
<!ELEMENT email (to, from, heading, body)>
<!ELEMENT to (#PCDATA)>
<!ELEMENT from (#PCDATA)>
<!ELEMENT heading (#PCDATA)>
<!ELEMENT body (#PCDATA)>
]>
```

Formative Assessment

Application-Oriented Questions

1. Represent the following XML code in a tabular format:

```
<?xml version="1.0"
encoding="utf-8"?>
<?xml-stylesheet href="Style.css"
type="text/css"?>
<AuthorsList>
<Authors au_id="648-92-1872">
<au_lname>Alam</au_lname>
<au_fname>Mehboob</au_fname>
</Authors>
<Authors au_id="238-95-7766">
<au_lname>Kumar</au_lname>
<au_fname>Vijay</au_fname>
</Authors>
<Authors au_id="427-17-2319">
<au_lname>Gill</au_lname>
<au_fname>Dipika</au_fname>
</Authors>
<Authors au_id="213-46-8915">
<au_lname>Atreya</au_lname>
<au_fname>Arsh</au_fname>
</Authors>
<Authors au_id="527-72-3246">
```

```
<au_lname>Bisht</au_lname>
<au_fname>Diya</au_fname>
</Authors>
<Authors au_id="472-27-2349">
<au_lname>Saxena</au_lname>
<au_fname>Puneet</au_fname>
</Authors>
<Authors au_id="846-92-7186">
<au_lname>Joshi</au_lname>
<au_fname>Lalit</au_fname>
</Authors>
</authorslist>
```

Ans. The tabular representation of the above mentioned code is shown as follows:

au_id	au_lname	au_fname
648-92-1872	Alam	Mehboob
238-95-7766	Kumar	Vijay
427-17-2319	Gill	Dipika
213-46-8915	Atreya	Arsh
527-72-3246	Bisht	Diya
472-27-2349	Saxena	Puneet
846-92-7186	Joshi	Lalit

2. Identify whether the following code is well-formed or not:

```
<?xml version="1.0"
encoding="UTF-8"
standalone="yes"?>
Let&apos;s know the name, address, date of
birth, &amp; date of join of the employee
<Name> Petter Jones </Name>
<Address>house no 23, lane no 24,
Daryaganj, Delhi </Address>
<DOB>&lt;24/12/1987&gt;</DOB>
<DOJ>&lt;23/1/2010&gt;</DOJ>
</Employees>
```

Ans. The following code is not well formed because there is no root element in the starting.

3. Find mistakes in the following code:

```
<?xml version="1.0"
encoding="utf-8"?>
<!-- <Person> is the root
element-->
<person>
<!-- <name> is the child element
of <person>-->
<name>
<first_name>Petter</First_name>
<last_name>Smith</last_name>
</name>
<!-- <address> is the child
element of <person>-->
<address>
<house_no>26</house_no>
<lane_no>12</lane_no>
<city>Delhi</city>
<state>Delhi</state>
<country>India</country>
</address>
<!-- <contact_no> is the child
element of <person>!-->
```

```
<contact_no>
<land_line>011454678</land_line>
<mobile>9897654351</mobile>
</contact_no>
```

Ans In the preceding code, there are the following two mistakes:

- The <person> tag is not closed
- The casing of the closing tag of the <first_name> tag is incorrect

4. Check whether the following XML document is well-formed or not:

```
<?xml version="1.0"
encoding="ISO-8859-1"?>
<Catalog>
<Cd>
<Title>Run</Title>
<Artist>Abhishek</Artist>
<Company>Columbia</Company>
<Price>10.90</Price>
</Cd>
<Cd>
<Title>Hide and Seek</Title>
<Artist>Rony</Artist>
<Company>CBS Records</Company>
<Price>9.90</Price>
</Cd>
</Catalog>
```

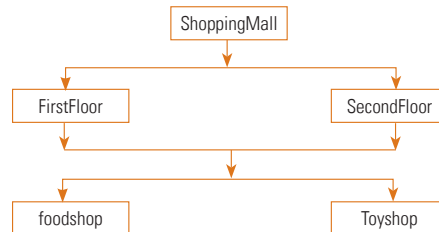
Ans. Yes, it is a well-formed XML document as this document follows XML guidelines and uses descriptive tags.

Unsolved Examination Questions

1. Draw the XML tree for the code given below: (Delhi 2013, 2012)

```
<ShoppingMall>
<FirstFloor>
<foodshop>2</foodshop>
<Toyshop>2</Toyshop>
</FirstFloor>
<SecondFloor>
<foodshop>1</foodshop>
<Toyshop>2</Toyshop>
</SecondFloor>
</ShoppingMall>
```

Ans.



2. Which of them is the correct statement? (Delhi 2013, 2012)

- a. All XML elements must have a closing tag.
- b. All XML elements must be in lower case.
- c. All XML documents must have a DTD.
- d. All of the above.

Ans. a

3. The XML file conforming to syntax or grammar rules is called: (Delhi 2013)
- Correct document
 - Valid document
 - Well-formed document
 - Confirmed document

Ans. c

4. is used to describe data and is used to display data. (Delhi 2013)

Ans. XML, HTML

5. Anything written between is taken as a comment. (Delhi 2013, 2012)

- `<?-->`
- `<?---?>`
- `<!-and-->`
- `</-->`

Ans. c

6. What is the full form of DTD? (Delhi 2013, 2012)

- Document To Definition
- Dynamic To Definition
- Document Type Definition
- Direct Type Definition

Ans. c

7. XML stands for:

- Extensible Markup Language
- Extended Markup Language
- Extensible Makeup Language
- Extended Makeup Language

Ans. a

8. In all XML documents, the element is the parent of all other elements. (Delhi 2011)

Ans. root