UNIVERSITY *of* LIMERICK

O L L S C O I L   L U I M N I G H

Faculty of Science and Engineering
Department of Computer Science and Information Systems

End-of-Semester Exam

Academic Year:	2008/2009	**Semester:** Autumn	
Module Title:	Document Architectures	**Module Code:** CS4146	
Exam Duration:	2½ Hours	**Total Marks:** 75	
Lecturer:	Dr. N. S. Nikolov	(1 mark is equal to 1% of the final grade)	

Instructions to Candidates:

Please write **ALL** answers in the answer booklet.
State clearly any assumptions you make.

PART A – Multiple-Choice and Short-Answer Questions (25 marks)
Answer all questions.

Q.1 Which one of the following is considered a binary text document format?　　　　**(2 marks)**

Q2. Which technologies can be used to separate structure from presentation in a web page?　　　　**(2 marks)**

Q3. Which of the following is NOT an XML Schema language?　　　　**(2 marks)**

Q4. If used in a DTD, A+ refers to element A occurring　　　　**(2 marks)**

Q5. What are the four requirements for an XML document to be well formed? **(5 marks)**
Can an XML document be well formed but not valid? Why?

Q6. Consider the `tvshow.xml` file printed in the next page. **(5 marks)**
What do the following XPath expressions refer to in `tvshow.xml`?

Q7. Which of the follwing technologies is NOT part of AJAX **(2 marks)**

Q8. Compare briefly bitmaps vs. vector images. **(5 marks)**

The following three files: `tvshow.xml`, `tvshow.html` and `tvshow.js` are given below. Assume they are stored in the same directory.

`tvshow.xml`

```
<?xml version="1.0" encoding="UTF-8"?>

<tvshow year="1999" rating="PG" season="1">
    <title>Futurama</title>
    <genrelist>
       <genre name="Animation"/>
       <genre name="SciFi"/>
       <genre name="Comedy"/>
    </genrelist>
    <creator>
       <name>Matt Groening</name>
    </creator>
    <cast>
       <castmember role="Philip J. Fry">
          <name>Billy West</name>
       </castmember>
       <castmember role="Turanga Leela">
          <name>Katey Sagal</name>
       </castmember>
    </cast>
</tvshow>
```

`tvshow.html`

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html14/strict.dtd">
<html>
  <head>
    <title>TV Show</title>
    <script type="text/javascript" language="JavaScript" src="tvshow.js">
    </script>
  </head>
  <body onload="javascript:dislpayTVShowTitle('tvshow.xml')">
    <h1>TV Show Title:</h1>
    <div id="title_container"/>
  </body>
</html>
```

`tvshow.js`

```
function dislpayTVShowTitle(filename)
{
    var xmlDoc = new ActiveXObject('Microsoft.XMLDOM');
    xmlDoc.load(filename);
    var tvShowTitle = xmlDoc.getElementsByTagName('title').item(0).firstChild.nodeValue;
    var textdata = document.createTextNode(tvShowTitle);
    var newParagraph = document.createElement('p');
    newParagraph.appendChild(textdata);
    document.getElementById('title_container').appendChild(newParagraph);
}
```

Q9. **(10 marks)**

What should happen when **tvshow.html** is loaded into a browser that runs on the machine where the three files are stored? Explain with a few sentences. Will the result be the same for any browser?

Q10. **(15 marks)**

Write a DTD for tvshow.xml. Make the DTD require at least one **genre** element to be present in the content of the element **genrelist**.

Hint: Use the DTD declarations:
```
<!ELEMENT name (type)>
<!ATTLIST element_name
          attribute_name type default_value
          attribute_name type default_value
          …
>
```

Q11. **(10 marks)**

Draw the XML DOM tree for **tvshow.xml**. For each node, specify its *name*, its *type* and its *value*.

Q12. **(15 marks)**

Write a new version of **tvshow.js** which uses an XMLHttpRequest object for requesting the content of the XML file **tvshow.xml** from a web server.

Q13. **(15 marks)**

Write an XSLT stylesheet which transforms **tvshow.xml** into **tvshow2.xml**. The XSLT stylesheet should be generic, i.e. it should be applicable to other XML files with the same structure as **tvshow.xml**.

tvshow2.xml
```
<?xml version="1.0" encoding="UTF-8"?>

<tvshow year="1999" rating="PG" season="1">
    <title>Futurama</title>
    <genre>Animation</genre>
    <genre>SciFi</genre>
    <genre>Comedy</genre>
</tvshow>
```

End of Exam