National College of Ireland

National College of Ireland

Higher Diploma in Web Technologies (Part-Time Day), Year 1, HDIPWEBTECHD 1
Higher Diploma in Web Technologies (Part-Time Evening Group 1), Year 1, HDIPWEBTECHG1
Higher Diploma in Web Technologies (Part-Time Evening Group 2), Year 1, HDIPWEBTECHG2

Semester 2 Examinations – 2010/11

Saturday 14th May, 2011
10:00am – 11:30pm

Web Application Development

Dr. John Keating
Mr. Michael Bradford

Answer all questions

Duration of exam: 1 hour 30 minutes
Attachments: no attachments

SECTION A – XML and Markup Languages **[25 marks]**

1. Answer all question parts (i) – (vi).

(i) What is meant by the statement that "two XML elements are *siblings"*?

[4 marks]

(ii) Draw a tree-diagram graph to represent the structure of the following XML document:

```
<directory>
  <listings>
    <listing>
      <name>Aardvark</name>
      <age>22</age>
      <city>Dublin</city>
    </listing>
    <listing>
      <name>Murphy</name>
      <age>99</age>
    </listing>
  </listings>
</directory>
```

[4 marks]

(iii) What is an entity reference? How would you use entity references to store the string expression **M. O'Leary & Son** in an xml element called *businessName*.

[4 marks]

(iv) What is the purpose of using a *namespace* in an XML document?

[4 marks]

(v) What are the similarities between HTML and XML?

[4 marks]

(vi) Describe how XML can be used in modern web applications to separate the presentation of data from the actual data content itself?

[5 marks]

SECTION B – XPath **[25 marks]**

2. Answer all question parts (i) – (v)

(i) What is XPath?

[5 marks]

(ii) Write an XPath expression that would select all the attributes named **size** from an XML document.

[5 marks]

(iii) Write an XPath expression that would select all the elements from an XML document that had an **id** attribute.

[5 marks]

(iv) What elements in an XML document would be identified by the following XPath expression:

//person[@adult="yes"]

[5 marks]

(v) What elements in an XML document would be identified by the following XPath expression:

/*/*

[5 marks]

SECTION C – Transformations **[25 marks]**

3. Answer all question parts (i) – (ii)
   (i) What is XSLT?

[5 marks]

   (ii) Consider the XML document *listings.xml* in Appendix 1. Write the contents of the *listings.xsl* file using XSLT and XPath so that the text value of each **listEntry** element is printed out as a HTML unordered list.

[20 marks]

SECTION D – Validation **[25 marks]**

4. Answer all question parts (i) – (iii)
   (i) List two advantages that XML Schema offers over Document Type Definitions.

[5 marks]

   (ii) What is meant by the following terms with respect to an XML document?
      a. Well-formed
      b. Valid

[5 marks]

   (iii) Given the XML Schema definition file *team.xsd* from Appendix 2. Create an XML file that would be successfully validated against this schema.

[15 marks]

Appendix 1 *listings.xml*

```
<?xml version="1.0"?>
<?xml-stylesheet href="listings.xsl" type="text/xsl"?>
<listings>
    <URL>http://www.webappdev.nci/listings</URL>
    <sector>8</sector>
    <subSector>Meaning and Inference</subSector>
    <listingEntries type="summary">
       <category>Metadata</category>
       <listEntry id="1">Inertial Linguistics</listEntry>
       <listEntry id="2">Mark-up Mark-up</listEntry>
       <listEntry id="3">No More Circular References</listEntry>
    </listingEntries>
</listings>
```


Appendix 2 *team.xsd*

```
<?xml version="1.0"?>
<xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:element name="team">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element ref="player"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:element name="player">
    <xsd:complexType>
      <xsd:sequence>
        <xsd:element ref="name" minOccurs="1" maxOccurs="unbounded"/>
        <xsd:element ref="skill" minOccurs="2" maxOccurs="unbounded"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
  <xsd:element name="name" type="xsd:string"/>
  <xsd:element name="skill" type="xsd:string"/>
</xsd:schema>
```