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Student Name:

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COMP 4711 Final Exam

April 16, 2008

Instructions:

You have 120 minutes to complete the exam.
This exam is out of 83 marks.

There are 25 multiple choice questions, worth one mark each.
There is a single correct (or most correct) answer to each of these.

There are 10 fill-in-the-blank questions, worth two marks each.
Each of these has a single word or phrase expected as an answer.

There are 6 short answer questions, worth three marks each.
Finally, there are 2 longer questions, worth 10 marks each.

No books, calculators, laptops, cellphones, or cheat sheets are permitted.

You may not leave until the half-way point, unless all registered students are present.

1. In JDOM, an XML document is normally saved as a *.XML file* using:

- (a) An XMLOutputFactory object
- (b) An XMLOutputter object
- (c) The toString() method of an org.jdom.Document object
- (d) The toString() method of an org.w3c.dom.Document object

- (e) None of the above

2. In XML, an *attribute* is:

- (a) A complex element type
- (f) A field with accompanying get & set methods
- (g) A key / value pair associated with an element
- (h) An allowed value of a sub-element

- (i) None of the above

3. *Self, parent, child* and *ancestor* are examples of:

- (a) Attributes
- (j) Elements
- (k) Entities
- (l) XPATH axes
- (m) XSL templates

4. Which of the following will return the *text content* directly inside an org.jdom.Element stuff?

- (a) stuff.getContent()
- (n) stuff.getQualifiedText()
- (o) stuff.getTextTrim()
- (p) stuff.getValue()
- (q) stuff.toString()

5. Which of the following packages provides the *main SAX interfaces*?

- (a) javax.xml.sax
- (r) org.w3c.sax
- (s) org.xml.sax
- (t) org.sax.xml
- (u) org.xml.sax.helpers

6. Which of the following conventions deals with the *selection of element sets* inside an XML document?

- (a) Schema
- (v) XPath
- (w) XSelect
- (x) XSL
- (y) XSLT

7. The stylesheet syntax using square brackets, along the lines of *[artist='Bob Dylan']*, is called which of the following?

- (a) Filtering
- (z) Guarding
- (aa) Selection
- (bb) Squaring
-
- (cc) It does not have any special name

8. Which of the following Javascript expressions is most reasonable for *replacing the content* of a specific HTML page element with a new text value retrieved using Ajax?

- (a) `document.getElementById("zone").html = xhr.responseText;`
- (dd) `document.getElementById("zone").innerHTML = xhr.responseText;`
- (ee) `document.getElementById("zone").setText(xhr.responseText);`
- (ff) `document.innerHTML = xhr.responseText;`
- (gg) `document.zone.html = xhr.responseText;`

9. Which of the following user browser actions is *likely to work differently* if you employ Ajax in your webapp?

- (a) Following a hyperlink on a webpage
- (hh) Hitting the browser back button
- (ii) Pausing or resuming a sound clip using an embedded Flash widget
- (jj) Resizing the browser window
- (kk) These work the same with or without Ajax

10. The convention for *finding a web service* on a given server is called

- (a) ActiveX
- (ll) DNS
- (mm) HTTP
- (nn) LDAP
- (oo) UDDI

11. The *Semantic Web* uses which convention to describe concepts and relationships in a knowledge domain?

- (a) RDF
- (pp) SWF
- (qq) UMF
- (rr) WSDL
- (ss) XML

12. Which of the following is an unreasonable expectation of a stylesheet?

- (a) Convert an XML document into an HTML one
- (tt) Process some elements more than once
- (uu) Select elements to include in a transformation
- (vv) Validate an XML document
- (ww) All of the above are reasonable expectations

13. `<%= (e.toString() + "") %>` in JSP is an example of:

- (a) A custom tag
- (xx) A declaration
- (yy) A directive
- (zz) A scriptlet
- (aaa) An expression

14. Which of the following will return the *set of nested content elements* directly inside an `org.jdom.Element` stuff?

- (a) `stuff.getContent()`
- (bbb) `stuff.getQualifiedText()`
- (ccc) `stuff.getTextTrim()`
- (ddd) `stuff.getValue()`
- (eee) `stuff.toString()`

15. Which of the following is the correct *relationship for SOAP*?

- (a) SOAP is built on top of web services
- (fff) SOAP requires triple-DES for encryption
- (ggg) SOAP uses the WSDL standard when used on workstations
- (hhh) Web services are built on top of SOAP
- (iii) Web services use the SOAP standard to ensure clean messages

16. Which of the following is the most important *real-world use of XML* at the moment?

- (a) Application integration
- (jjj) Data cleansing
- (kkk) Data storage
- (lll) Data transfer within an application
- (mmm) Webpage construction

17. In an Ajax callback function, a *communication error* is discovered/handled by

- (a) Checking for an alert
- (nnn) Checking for an exception
- (ooo) Checking the request readyState variable
- (ppp) Checking the request status variable
-
- (qqq) Communication errors cannot be detected

18. JSP directives are used to:

- (a) Encapsulate Java expressions
- (rrr) Provide authorization information
- (sss) Specify how servlet translation will be handled
- (ttt) Specify XPATH expressions
- (uuu) Supplement HTML

19. Which of the following is the Apache foundation's *XSLT package*, commonly used in Java?

- (a) BATIK
- (vvv) TOMCAT
- (www) XALAN
- (xxx) XERCES
- (yyy) XML-RPC

20. Which of the following is specified in the *body of a SOAP message*, and not in its envelope?

- (a) Message processing rules
- (zzz) The body schema
- (aaaa) The envelope schema
- (bbbb) The intended recipient
-
- (cccc) All of these are specified in a SOAP message body

21. Which of the following is the correct *object relationship* for SAX processing?

- (a) Assign a content handler and a SAX parser to a Document
- (dddd) Assign a content handler to a SAX parser
- (eeee) Assign a DOM event handler to a SAX parser
- (ffff) Assign a SAX handler to a DOM object
- (gggg) Assign a SAX parser to a content handler

22. The stylesheet *technique for re-ordering data*, like a pivot table in a spreadsheet, is called (the)

- (a) Bourne transformation
- (hhhh) Cross-summing
- (iiii) Muenchian method
- (jjjj) Pivoting
- (kkkk) Sub-totalling

23. When building a JSP, where does a *JSP declaration* go in your source file?

- (a) Anywhere in the file
- (llll) At the beginning of the file
- (mmmm) At the end of all HTML content
- (nnnn) Before the first reference to any variable or method being declared
- (oooo) Between any directives and the HTML element

24. Which of the following is not a *JSP implicit object*?

- (a) context
- (pppp) out
- (qqqq) request
- (rrrr) response
- (ssss) session

25. An XML document is *bound to a stylesheet* using which of the following?

- (a) A processing instruction embedded in the document
- (tttt) An attribute in the root element of the document
- (uuuu) An attribute of the ?xml directive
- (vvvv) An attribute of the ?xml-stylesheet directive
- (wwwwww) Calling the `setStylesheet(...)` method of a `javax.xml.transform.Transformer` object

Completion Questions (2 marks each)

26. A set of standards and/or conventions that address the *format and interpretation of a data stream* is known as a(n)

27. An abbreviation or *short form for some text* in an XML document is a(n)

28. The *stylesheet directive* to select an element to format is:

29. A server-side XSL transform, done using a JSP, *wraps the XML document* using which class?

30. Which specification does XML-RPC use for *message transport*?

31. The stylesheet directive to *sort an element set* is:

32. The Java conventions for *processing transformations* are called:

33. The *XPath character sequence* that is used to search elements starting from the root of an XML document is:

34. The emerging XML-based standard for *specifying a user interface* is:

35. The main *browser class used for Ajax* is:

Short Answer Questions (single sentence, 3 marks each)

Yes, that means marks automatically deducted if you use more than a single sentence in an answer.

36. What is meant by the acronym *AJAX*?

37. What is the significance of *SOAP*?

38. Explain the difference between *DOM* and *SAX* processing of an XML document.

39. Provide a good justification for using the *W3C DOM* instead of *JDOM* for XML processing in Java.

40. Explain what the *XPath location* `"/order[@status='paid']/item[1]"` means.

41. Explain the difference between an *XML-RPC handler* and an *XML-RPC server*.

Hard Questions (10 points each)

Note: not looking for “picture-perfect” code – minor syntax errors will be over-looked :)

42. An XML document is shown below. Construct a *stylesheet* that will produce an HTML page showing (legibly) an order ID and the details (one per line).

```
<?xml version="1.0"?>
<order id="234234">
  <customer id="123">Jim</customer>
  <how>take-out</how>
  <details>
    <item><code>Big Mac</code><qty>1</qty></item>
    <item><code>Fries</code><size>small</size><qty>1</qty></item>
    <item><code>Coffee</code><qty>2</qty></item>
  </details>
</order>
```

43. An Order class is shown below. Construct a reasonable *JSP* which will get such an object from the user session, using the key “order”, and display the order legibly, with a count of the number of items.

```
public class Order {  
    public String id, customer, customerName, how;  
    java.util.ArrayList<Item> details;  
    class Item {  
        public String code; int qty; String size;  
    }  
}
```