UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2013/2014 – 3rd Year Examination – Semester 5

IT5404: Internet Application Development
Structured Question Paper

09th March, 2014
(TWO HOURS)

To be completed by the candidate

BIT Examination Index No: --

Important Instructions:

- The duration of the paper is **2 (two) hours**.

- The medium of instruction and questions is English.

- This paper has **4 questions** and **13 pages**.

- **Answer all questions.** All questions **do not** carry similar marks.

- **Write your answers** in English using the space provided **in this question paper**.

- Do not tear off any part of this answer book.

- Under no circumstances may this book, used or unused, be removed from the Examination Hall by a candidate.

- Note that questions appear on both sides of the paper.
  If a page is not printed, please inform the supervisor immediately.

Questions Answered

Indicate by a cross (✗), (e.g. ✗) the numbers of the questions answered.

	Question numbers			
To be completed by the candidate by marking a cross (✗).	1	2	3	
To be completed by the examiners:				

1)   (a) Detailed here are similarities and differences between web pages and web services. Complete the table given below;

(5 Marks)

ANSWER IN THIS BOX

Characteristics	Web Pages	Web Services
Transport mechanism	HTTP/SMTP/FTP	HTTP/SMTP/FTP
URLs	Yes	Yes
Message Format	HTML	XML
Information types	Embedded Data	Structured Data
Remote Application communication	No	Yes

(b) What is meant by the Web Service Technology Stack ?

(5 Marks)

ANSWER IN THIS BOX

A set of layers that make up a Web Service, called the Service technology stack.

This is considered an abstract model of how the various technologies are assembled to build a Web Service.

Each abstract layer can be implemented using any protocol or standard.

The only requirement is that both parties commit to the standards used so they can communicate

(layers: Discovery, Description, Messaging, Transport, Network)

(c) What are the layers that make up a web service? Briefly explain each one of them.

(10 marks)

a. Discovery
b. Description
c. Messaging
d. Transport
e. Network

Discovery: The discovery layer allows developers and businesses to accomplish two major functions;

  a. It allows organizations to publish their business information to a registry, as well as the descriptions of web services that are offered by this organization.

  b. It allows clients to inquire for information available in the registry. This is done in a manner similar to how users find links using a regular search engine.

Description:
This helps describe a web service. Such as its methods, the input and output parameters and their respective data types and the types of massage and interaction patterns supported by the services. Provides information on the various protocols used in the lower layers.

Messaging:
The messaging layer, probably most important facet of web services, contains instructions or documents to be exchanged between applications.

Transport:
The transport layer is of significant importance to the developer because it services as the protocol that either communicates with or exposes a web service.

Network

The network layer defines how packets are addressed, organized, routed and disassembled over the wire.

Continued

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(d) For each of the layers explained in (c) above, List at least one Protocol/Standard that defines the layer.

(5 marks)

ANSWER IN THIS BOX

Discovery   : (UDDI, DISCO,WSIL,ebXML)
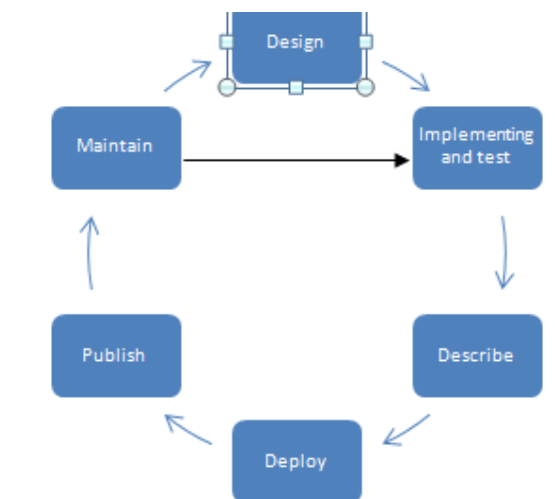
Description : (WSDL, RDF, ebXML)

Messaging   :(SOAP, XML-RPC (XML))

Transport   :(HTTP,SMTP,FTP,)

Network   :(TCTP,IP, UDP)

2) (a) Outline the phases of the Web Service Development Life-cycle and briefly explain the task of each phase.

(10 Marks)

ANSWER IN THIS BOX

Continued

Design:
Figure out what kind of Web Service we want to build. Whether legacy business logic is to be exposed or new PHP code should be created etc…whether several existing web services should be aggregated to coordinate a business process. What toolkit we plan to use, which protocol we plan to support etc

Implement and test:
Use selected toolkit and create a web service server… implementing
Check interoperability issues between the various toolkits, application integrations, ensure various applications are working fine.

Describe and deploy:
Create description documents using WSDL, using toolkits, the description documents is created and possibly deployed on the server. Specify the data type

Publish
Publish your web site

Maintain:
Resembles what you would normally do when administrating traditional web application. This ensuring that the application is performing, is secure, and that the developers may implement new features and bug fixes as required.

(b) List five (05) well known XML–based languages that are supported either on the web or in major XML–based applications, along with the kinds of information they represent.

(5 Marks)

ANSWER IN THIS BOX

WML: Wireless Markup Language – Web pages for mobile devices

MathML : Mathematical Markup Language- Mathematical Symbols and formulas

RDF: Resource Description framework) – Descriptions of information in web pages

OWL: Web Ontology Language – Semantic web pages (an extension of RDF)

SOAP: (originally Simple Object Access Protocol) – Distributed application communication

SVG: (Scalable Vector Graphics) vector graphics

SMIL: Synchronized Multimedia Integration Languages – Multimedia presentation

RSS: Really Simple Syndication – Syndicated web site updates (News feeds and blog entries) ,

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(c) What is meant by describing XML as a meta-language?

(5 Marks)

ANSWER IN THIS BOX

When XML is referred to as a meta-language, it means that XML is a language used to create other markup languages. XML relies heavily on metadata to add meaning to the content in XML documents. RDF and OWL are examples of XML vocabularies that expand on the concept of metadata by attempting to as meaning to web pages.

(d) The key to XML's accuracy lies in a few simple rules. List five (05) conditions for a document to be well-formed in XML.

(5 Marks)

> ### ANSWER IN THIS BOX
>
> a. Tag names are case sensitive
>
> b. Every opening tag must have a corresponding closing tag
>
> c. A nested tag pair cannot overlap another tag
>
> d. Attribute values must appear within quotes
>
> e. Every document must have a root element.

3) (a) What are the three typical steps involved in working with a data file in PHP?

(3 Marks)

> ### ANSWER IN THIS BOX
>
> a. Open the file you want to work with by associating a file handle with it
>
> b. Read from or write to the file using the file handle
>
> c. Close the file using the file handle

(b) Briefly explain the "fopen ( )" Function.

(4 Marks)

ANSWER IN THIS BOX

The fopen( ) is used to open a file, returning a file handle associated with the opened file.

(c) List three arguments of "fopen ( )".

(3 Marks)

ANSWER IN THIS BOX

    a. File name,
    b. Mode and
    c. Optional use_include_path

(d) Briefly explain the values which can be replaced by "r" in the following code;

```
$fp = fopen("./abc/data.txt", "r");
```

(5 Marks)

ANSWER IN THIS BOX

value	Description
r+	Open file for reading and writing. The file position indicator is placed at the beginning of the file
w	Open file for writing only. Any existing content will be lost. If the file does not exist , PHP attempts to create it
w+	Open file for reading and writing, Any existing file content will be lost. If the file does not exist, PHP attempts to create it.
a	Open file for appending only. Data is written to the end of an existing file. If the file does not exist, PHP attempts to create it
a+	Open file for reading and appending. Data is written to the end of an existing file. If the file does not exist, PHP attempts to create it.

(e) What would be the output of the following PHP code?

```php
<?php
 for($x=1; $x<3;$x++)
   {
     for ($y=1; $y<5;$y=$y + 2)
       {
         for($z=5; $z>3;$z - -)
         {
             echo ("X holds: $x, Y holds:$y, Z holds:$z <br>");
         }
       }
   }
?>
```

(5 Marks)

<u>**ANSWER IN THIS BOX**</u>

4) (a) Identify the error in the following XML code and make the correction.

```
<pets>
      <pet name = "Bunty" type = "dog" age = "4">
      <pet>
      <pet name = "Kitty" type = "cat" age = "2">
</pets>
      </pet>
```

(5 Marks)

<u>**ANSWER IN THIS BOX**</u>

```
<pets>
   <pet name = "Bunty" type = "dog" age = "4">
   </pet>
   <pet name = "Kitty" type = "cat" age = "2">
   </pet>
</pets>
```

OR

```
<pets>
   <pet name = "Bunty" type = "dog" age = "4" />
   <pet name = "Kitty" type = "cat" age = "2" />
</pets>
```

- Note:-Move closing </pet> tag so that is enclosed within the pets elements or move the opening <pet> tag so that is outside of the pets elements.

(b) Explain the following XML code using the relevant line numbers.

```
1.    <?xml version="1.0" encoding="ISO-8859-1"?>
2.    <note>
3.        <name>Nimal Perera</name>
4.        <no>35</no>
5.        <street>Saranankara Road</street>
6.        <town>Nugegoda</town>
7.    </note>
```

(7 Marks)

ANSWER IN THIS BOX

Line 1. The first line is the XML declaration. It defines the XML version (1.0) and the encoding used (ISO-8859-1 = Latin-1/West European character set).

Line 2. The next line describes the **root element** of the document (like saying: "this document is a note"):

Line 3,4,5,6. The next 4 lines describe 4 **child elements** of the root (name, no, street, and town):

Line 7. And finally the last line defines the end of the root element:

(c) What is the purpose of the DTD in XML? Give the DTD for the example in part (b).

(5 Marks)

ANSWER IN THIS BOX

The purpose of a DTD is to define the structure of an XML document. It defines the structure with a list of legal elements:

<!DOCTYPE note
[
<!ELEMENT note (to,from,heading,body)>
<!ELEMENT to (#PCDATA)>
<!ELEMENT from (#PCDATA)>
<!ELEMENT heading (#PCDATA)>
<!ELEMENT body (#PCDATA)>
]>

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(d) What are the three main components of a web service that the Web Services Description Language (WSDL) describes?

(3 Marks)

ANSWER IN THIS BOX

    a. Data Types
    b. Operations
    c.   Protocol bindings

(e) What is the role of WSDL in web Services?

(5 Marks)

ANSWER IN THIS BOX

    a. WSDL allows us to publish the API of our web services, documenting exactly what they do and how
    b. They can write code that interacts with the service.
    c. In addition to helping web service client and server communication.
    d. Other benefits include the possibility of generating source code template, building application interfaces at runtime and increasing the maintainability of our Web service servers and clients.

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