



UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESI 2015/2016**

COURSE NAME : WEB SERVICES TECHNOLOGY
COURSE CODE : BIW 20404
PROGRAMME CODE : BIW
EXAMINATION DATE : JUNE / JULY 2016
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF **EIGHT (8)** PAGES

SECTION A

Determine whether each of these statements is **True** or **False**.

- Q1** You can use C# to build new web services on Windows that can be invoked from your web application that is based on JavaServer Pages (JSP) and runs on Linux. (1 mark)
- Q2** A web service takes the help of Web Service Description Language (WSDL) to tag and format the data. (1 mark)
- Q3** The eXtensible Mark-up Language (XML) Messaging layer is responsible for transporting messages between applications. (1 mark)
- Q4** The Service Registry is a central place where developers can publish new services or find existing ones. (1 mark)
- Q5** AXIS2 is an example of REST– based Java Web Service implementation. (1 mark)
- Q6** The following code fragment is correct for Java Web Service.

```
@WebMethod(operationName = "myMethod")
public String myMethod (String txt) {
    return "Hello " + txt + " !";
}
```

 (1 mark)
- Q7** Man in the middle is a type of attack where the attacker secretly relays and possibly alters the communication between two parties. (1 mark)

- Q8** IP packet filtering firewalls employ a filtering process by examining IP packets batch. (1 mark)
- Q9** Java Database Connectivity (JDBC) is an application programming interface (API) for Java programming language which defines how a client may access a database. (1 mark)
- Q10** XML Encryption involves encrypting the XML canonical form using public-key encryption. (1 mark)

SECTION B

Choose the best answer for each of the following questions.

- Q11** Which of the following is correctly describing the Web service?
(A) It is available over the Internet or private networks.
(B) It uses a standardized XML messaging system.
(C) It is not tied to any operating system or programming language.
(D) All of the above.

(1 mark)

- Q12** Which of the following role of web service architecture utilizes an existing web service by opening a network connection and sending an XML request?
(A) Service Provider
(B) Service Requestor
(C) Service Registry
(D) None of the above

(1 mark)

- Q13** Which of the following is correctly describing loosely coupled architecture of web service?
(A) A consumer of a web service is not tied to that web service directly.
(B) The web service interface can change over time without compromising the client's ability to interact with the service.
(C) Adopting a loosely coupled architecture tends to make software systems more manageable and allows simpler integration between different systems.
(D) All of the above.

(1 mark)

- Q14** For the XML document “src.xml”, select which of the following correctly describes the namespace to which the type attribute of the name element belongs.

```
[src.xml]
-----
<?xml version="1.0"?>
<product xmlns="urn:trial:exam0">
  <Information>
    <name type="Oil"
xmlns:depth="urn:trial:exam1">Ball_point_pen</name>
    <color>Black</color>
    <price>2_dollars</price>
  </Information>
</product>
```

- (A) Both urn:trial:exam0 and urn:trial:exam1
(B) urn:trial:exam1
(C) urn:trial:exam0
(D) No namespace to which the type attribute belongs

(1 mark)

- Q19** Which of the following is **true** about behavioral characteristics of web services?
- (A) Web Services uses XML at data representation and data transportation layers.
 - (B) A consumer of a web service is not tied to that web service directly.
 - (C) Businesses and the interfaces that they expose should be coarse-grained. Web services technology provides a natural way of defining coarse-grained services that access the right amount of business logic.
 - (D) All of the above.

(1 mark)

- Q20** Which of the following is correct about BEEP protocol?
- (A) This is a promising alternative to HTTP.
 - (B) BEEP is a new Internet Engineering Task Force (IETF) framework for building new protocols.
 - (C) Both of the above.
 - (D) None of the above.

(1 mark)

SECTION C

- Q21** (a) Outline **TWO (2)** general problems that can be solved by web services especially in Business-to-Business (B2B) environment. (5 marks)
- (b) Describe XML usage in Web Service. (2.5 marks)
- (c) Prepare a complete XML Schema for the XML instance in **Figure Q21(c)**.

```
<root xmlns:foo="http://www.foo.org/" xmlns:bar="http://www.bar.org">
  <actors>
    <actor id="1">Christian Bale</actor>
    <actor id="2">Liam Neeson</actor>
    <actor id="3">Michael Caine</actor>
  </actors>
  <foo:singers>
    <foo:singer id="4">Tom Waits</foo:singer>
    <foo:singer id="5">B.B. King</foo:singer>
    <foo:singer id="6">Ray Charles</foo:singer>
  </foo:singers>
</root>
```

Figure Q21(c)

(7 marks)

- Q22** (a) (i) Illustrate Web Services architecture layers using a diagram.
 (ii) Describe any **TWO (2)** of the layers based on your answer in **Q22(a)(i)**. (8 marks)
- (b) Compare between the basic standard web and web service architecture. Support your answer with illustrations. (5 marks)
- (c) SOAP Web Service and RESTful Web Service are two approaches for application integrations. Give **FOUR (4)** comparisons between SOAP Web Service and RESTful Web Service. (10 marks)
- Q23** (a) "SOAP is proven to solve the interoperability, traversal and the complexity issues in web applications."
 Distinguish between the independent and neutrality characteristics of SOAP which leads to the previous statement. (5 marks)
- (b) Illustrate the security topologies which involve the clients and the back-end applications using a diagram. (5 marks)

- (c) Give **THREE (3)** comparisons of network level and application level security mechanism. (7.5 marks)

Q24 Your company is planning to develop a simple web service which aims to be used as part of a payroll system. The service will be able to calculate the standard over-time pay in manufacturing sector. It will calculate the wage based on the over-time working hours per day. The payment rate is as in **Table Q24**.

Table Q24

Period of over-time working hours per day	Rate
1-2 hours	USD 15.50 per hour
> 2 hours	USD 12.00 per hour

Based on the given scenario,

- (a) Generate the WSDL file to describe the service. You are only required to write down the elements that come with tags `<message></message>` and `<portType></portType>`. (4.5 marks)
- (b) Develop the Web Service using Java programming. (7 marks)
- (c) Propose the right SOAP request from the client and the SOAP response from the provider. Assume that the input value is the additional working hours and the output is the pay that the person will receive. (6 marks)
- (d) For the security purpose, your team plans to extend the standard SOAP with security elements and also to have database connections. Therefore, they consider to change the basic JAX-WS implementation to AXIS2. Justify why such plan needs to be implemented. (7.5 marks)

- END OF QUESTION -