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Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2018/2019

COURSE NAME	:	WEB SERVICES TECHNOLOGY
COURSE CODE	:	BIW 20404
PROGRAMME CODE	:	BIW
EXAMINATION DATE	:	JUNE / JULY 2019
DURATION	:	3 HOURS
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **SEVEN (7)** PAGES

SECTION A

Select the **BEST** answer to the following multiple choice questions.

Q1 Well-formed eXtensible Markup Language (XML) document means _____.
A. it contains a root element
B. it contains an element
C. it contains one or more elements
D. it must contain one or more elements and root element must contain all other elements

(1 mark)

Q2 The following are SOAP Transport Protocols, EXCEPT _____.
A. Blocks Extensible Exchange Protocol
B. Hypertext Translink Protocol
C. Simple Mail Transfer Protocol
D. File Transfer Protocol

(1 mark)

Q3 Web services perform encapsulated business functions such as _____.
A. a self-contained business task
B. a service-enabled resource
C. a one-line-code application
D. All of the above

(1 mark)

Q4 Which of the following is XML grammar?
A. Document Type Definition
B. XML X-Definition
C. Schematree
D. All of the above

(1 mark)

Q5 Which of the following statement is the BEST?
A. AXIS2 is an engine for constructing REST-based service.
B. AXIS2 is a framework for constructing SOAP-based service.
C. REST is an engine for constructing SOAP-based service.
D. Spring is a framework for constructing only service-based application.

(1 mark)

Q6 Which of the following is a CORRECT Java Web Service method?

A.
```
@WebService(operationName = "hello")
        public String hello(@WebParam(name = "name") String txt) {
            return "Hello " + txt + " !";
    }
}
```

B.
```
@WebService(serviceName = "HelloWS")

        public String hello(@WebParam(name = "name") String txt) {
            String text = "Hello " + txt + " !";
            return text;
    }
}
```

C.
```
@WebMethod(OperationName = "hello")
        public String hello(@WebParam(name = "name") String txt) {
            return "Hello " + txt + " !";
    }
}
```

D.
```
@WebMethod(operationName = "hello")
        public String hello(@WebParam(name = "name") String txt) {
        String text = "Hello " + txt + " !";
            return text;
    }
}
```

(1 mark)

Q7 IP packet filtering firewalls employ a filtering process by _____.

A. checking each packet that passes through the gateway, verifying the contents of the packet up through the application layer
B. examining IP packets in batch
C. examining IP packets individually
D. perform basic packet filter operations and verify of the legitimacy of the sequence numbers used in establishing the connection

(1 mark)

Q8 _____ can be implemented to ensure the security during SOAP transfer.

A. Man-in-between
B. Secure-man
C. Man-in-the-middle
D. Handshaking

(1 mark)

Q9 Which of the following is NOT a role in web service?

A. Service provider
B. Service binder
C. Service registry
D. Service client

(1 mark)

Q10 Java Database Connectivity (JDBC) is _____.

A. an application programming interface (API) for creating Graphical User Interface (GUI)
B. an application programming interface (API) for Java programming language which defines how a client accessing a database
C. an agent to connect to web server
D. an application provider interface (API) for database connection

(1 mark)

SECTION B

Answer **ALL** questions.

Q11 (a) Describe REST-based Web Service.

(2 marks)

(b) Explain *Decoupled Invocation Pattern* and how it helps in solving usage issue in Web Service.

(4 marks)

(c) Propose a conceptual view for a National Education Management System based on Service Oriented Architecture (SOA). Draw a diagram to support your explanation.

(5 marks)

Q12 (a) Describe **TWO (2)** characteristics of SOAP that support Web Service solutions against the issues of interoperability and firewall traversal in Remote Procedure Call (RPC).

(4 marks)

(b) What is the relation between the structure of SOAP and Web Service Definition Language (WSDL)? Support your answer with an example.

(4 marks)

(c) Figure **Q12(c)** shows two unrelated Java Web Service methods. Analyze the figure, and then discuss about both methods in terms of *coupling*, and give suggestion on how we can solve any coupling issue which exist in the figure.

(5 marks)

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

```
@WebMethod(operationName = "getAddress")
    public String getAddress
    (@WebParam(name = "name") String name,
     @WebParam(name = "gender") String gdr,
     @WebParam(name = "age") int age,
     @WebParam(name = "IC") String ic,
     @WebParam(name = "carReg")
          String carReg)
    {
        //some commands to access database
        here

        return address;
    }
```

FIGURE Q12(c)

Q13 (a) Given an XML Schema in Figure **Q13(a)(i)** and an XML document in Figure **Q13(a)(ii).** Match the XML Schema with the XML document. Find **THREE (3)** mistakes from Figure **Q13(a)(ii)** based on Figure **Q13(a)(i)** and give suggestions to correct the mistakes.

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="Person">
 <xs:complexType>
 <xs:sequence>
  <xs:element name="Info">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="First" type="xs:string"/>
        <xs:element name="Middle" type="xs:string"
              minOccurs="0"/>
        <xs:element name="Last" type="xs:string"/>
        <xs:element name="Age" type="xs:int"/>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
  <xs:element name="Phone" type="xs:int"
maxOccurs="2"/>
  <xs:element name="Address" type="xs:string"/>
 </xs:sequence>
 </xs:complexType>
 </xs:element>
</xs:schema>
```

FIGURE Q13(a)(i)

```
<Person>
<Info>
     <Last>Abu</Last>
     <Middle>A.</Middle>
     <First>Ali</First>
     <Age>Twenty two</Age>
     <Phone>011111112</Phone>
     <Phone>073337686</Phone>
     <Address>Parit Raja, Batu Pahat, Johor</Address>
</Info>
</Person>
```

FIGURE Q13(a)(ii)

(5 marks)

(b) Demonstrate using a complete SOAP message, a possible response for an operation to get the current weather given the latitude and longitude of the location.

(5 marks)

Q14 (a) Describe **TWO (2)** directions to use database in Web Service.

(4 marks)

(b) Illustrate the general structure of WS-Security on SOAP by including sample of security-token in your illustration.

(6 marks)

(c) Cryptography is widely used in many fields for security. Assume that you want to secure the communication of web service. Explain **TWO (2)** similarities and **TWO (2)** differences of cryptography approach at network-level and application-level.

(7 marks)

Q15 You are working with Octo Software Sdn, Bhd. Your company is responsible in developing a web service for Inventory Checking.

(a) Demonstrate 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>`.

(5 marks)

(b) Write the appropriate Java Web Service client.

(5 marks)

(c) Write down a possible SOAP request.

(3 marks)

(d) Outline **TWO (2)** features each, to describe the scenario of a system utilizing inventory checking modules, before and after using the web service.

(6 marks)

- END OF QUESTION –