



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
(ONLINE)
SEMESTER II
SESSION 2019/2020**

COURSE NAME : WEB SERVICES TECHNOLOGY
COURSE CODE : BIW 20404
PROGRAMME CODE : BIW
EXAMINATION DATE : JULY 2020
DURATION : 2 HOURS 30 MINUTES
INSTRUCTION : 1. ANSWER ALL QUESTIONS
2. PLEASE MAKE SURE TO CLICK "SAVE ANSWER" BUTTON FOR SUBJECTIVE QUESTIONS. OBJECTIVE QUESTIONS ARE SAVED AUTOMATICALLY.

THIS QUESTION PAPER CONSISTS OF SIX (6) PAGES

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Q1 (a) Figure Q1(a) shows a system architecture. Explain TWO (2) problems of this architecture.

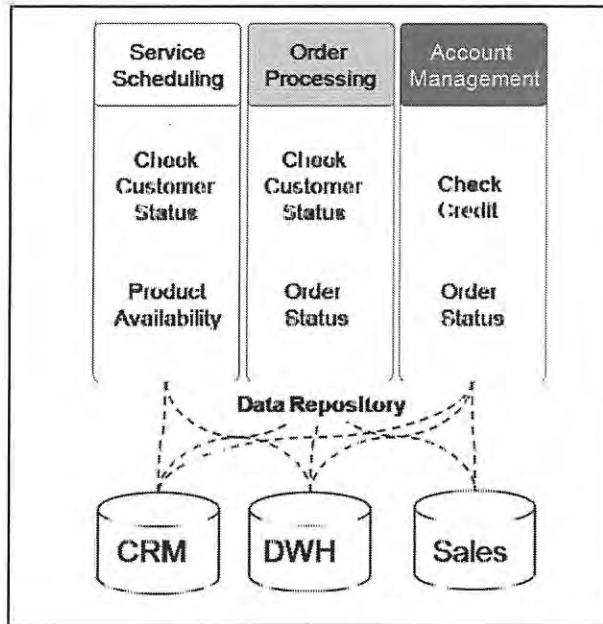


Figure Q1(a)

(6 marks)

(b) Discriminate between SOAP-based and REST-based Web Service in terms of implementation.

(3 marks)

Q2 (a) Write an XML file that can be generated from Airlines awards special database as presented in Table Q2(a).

Table Q2(a)

Promo- tion ID	Econo- my Class Point	Busi- ness Class Point	First Class Point	Airline	From	To	Start Date	End Date
0001	50000	60000	70000	MAS	KI.	Kyoto	01/01/20	01/06/20
0003	50000	65000	70000	Emirates	London	Singapore	02/01/20	30/04/20

(4 marks)

(b) Complete the missing statements in the Java client in Figure Q2(b). The service that client is requesting is supposed to respond the number of infected patients on a specific location in Malaysia with the recent COVID-19 disease.

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```

package PatientStat;

public class PatientStat {

    public static void main(String[] args) {
        System.out.println("THIS IS A PATIENT MONITORING SYSTEM");

        _____ output = _____

        System.out.println(output);
    }

    private static String getStat(int x) {

        org.covstat.CovstatWS_Service service = new
            org.covstat.CovstatWS_Service();

        return _____
    }
}

```

Figure Q2(b)

(3 marks)

(c) **Figure Q2(c)** shows a schema for XML Weather Data. Identify whether each of the following XML statement is valid if it is to be matched with the schema.

- (i) `<image>`
`<url>http://weather.gov/images/xml_logo.gif</url>`
`<title>NOAA's National Weather Service</title>`
`<link>http://weather.gov</link>`
`</image>`
- (ii) `<location>New York/John F. Kennedy Intl Airport, NY</location>`
`<station_id>KJFK</station_id>`
`<longitude>-73.78</longitude>`
`<latitude>40.66</latitude>`
`<observation_time_rfc822>Mon, 11 Feb 2008 06:51:00 -0500 EST`
`</observation_time_rfc822>`
- (iii) `<current_observation>`
`<!-- some XML statements here -->`
`</current_observation/>`
- (iv) `<station_id>ABCD</station_id>`
`<latitude>50.0</latitude>`
`<longitude>negative 66.3</longitude>`
- (v) `statement<icon_url_base>http://weather.gov/weather/images/fcic`
`ons/</icon_url_base>`
`<icon_url_name>nfew.jpg</icon_url_name>`
`<windchill_f>-7</windchill_f>`
`<windchill_c>-22</windchill_c>`
`<visibility_mi>10.00</visibility_mi>`

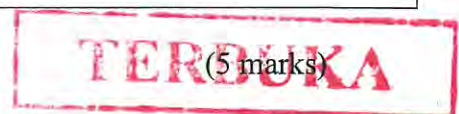
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```

<xs:schema attributeFormDefault="unqualified"
elementFormDefault="qualified"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="current_observation">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="credit" type="xs:string" />
        <xs:element name="credit_URL" type="xs:string" />
        <xs:element name="image">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="url" type="xs:string" />
              <xs:element name="title" type="xs:string" />
              <xs:element name="link" type="xs:string" />
            </xs:sequence>
          </xs:complexType>
        </xs:element>
        <xs:element name="location" type="xs:string" />
        <xs:element name="station_id" type="xs:string" />
        <xs:element name="latitude" type="xs:decimal" />
        <xs:element name="longitude" type="xs:decimal" />
        <xs:element name="observation_time_rfc822" type="xs:string" />
        <xs:element name="weather" type="xs:string" />
        <xs:element name="temp_f" type="xs:unsignedByte" />
        <xs:element name="temp_c" type="xs:byte" />
        <xs:element name="relative_humidity" type="xs:unsignedByte" />
        <xs:element name="wind_dir" type="xs:string" />
        <xs:element name="wind_degrees" type="xs:unsignedShort" />
        <xs:element name="wind_mph" type="xs:decimal" />
        <xs:element name="wind_gust_mph" type="xs:unsignedByte" />
        <xs:element name="pressure_mb" type="xs:decimal" />
        <xs:element name="pressure_in" type="xs:decimal" />
        <xs:element name="dewpoint_f" type="xs:byte" />
        <xs:element name="dewpoint_c" type="xs:byte" />
        <xs:element name="windchill_f" type="xs:byte" />
        <xs:element name="windchill_c" type="xs:byte" />
        <xs:element name="visibility_mi" type="xs:decimal" />
        <xs:element name="icon_url_base" type="xs:string" />
        <xs:element name="icon_url_name" type="xs:string" />
        <xs:element name="disclaimer_url" type="xs:string" />
        <xs:element name="copyright_url" type="xs:string" />
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>

```

Figure Q2(c)



Q3 (a) Cryptography is widely used in many fields for security. Assume that you want to secure the communication of Web Service. Explain **TWO (2)** similarities of cryptography approach at network-level and application-level.

(4 marks)

(b) Based on your understanding from the SOAP response in **Figure Q3(b)**, suggest **THREE (3)** details that we should put in the Web Services Description Language (WSDL) file

```
<?xml version="1.0"?>
<soap:Envelope
xmlns:soap="http://www.w3.org/2001/12/soap envelope"
soap:encodingStyle="http://www.w3.org/2001/12/soap-encoding">
  <soap:Body xmlns:m="http://www.bookshop.org/prices">
    <m:GetBookDataResponse>
      <m: Title>Harry Potter</m:Title>
      <m: Author>J. K. Rowling</m:Author>
      <m: Price>10.95</m: Price>
    </m:GetBookDataResponse>
  </soap:Body>
</soap:Envelope>
```

Figure Q3(b)

(6 marks)

Q4 You are working with Hex Software Sdn. Bhd. Your company is responsible for the development of a Web Service for calculating a new pension scheme for Malaysian government servants. This service can be requested by any local systems from the public sector. Pension amount can be calculated based on the period of service and the final salary received by the pensioner. The following formula can be used for the calculation.

$$\text{Pension monthly amount (RM)} = \frac{1}{500} \times \text{service period (in month)} \times \text{final salary (RM)}$$

(a) Demonstrate the possible WSDL document to describe the service. You are only required to write down the elements that come with tags <message></message>, <portType></portType> and <binding></binding>.

(6 marks)

(b) Write down a possible SOAP request if it is to be requested from UTHM integrated system.

(3 marks)

(c) Based on your answer in **Q4(a)**, identify child element(s) of the WSDL document that associate with the operations inside the Web Service.

(3 marks)



- (d) Discuss in details **TWO (2)** level of service abstractions. You must relate your discussion with the given case study. (5 marks)
- (e) Write the Web Service using Java. (12 marks)

- END OF QUESTION -

