UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2016/2017

TERBUKA

COURSE NAME	:	SEMANTIC WEB
COURSE CODE	:	BIW 30803
PROGRAMME CODE	:	3 BIW
EXAMINATION DATE	:	JUNE 2017
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FIVES (5)** PAGES

Q1 (a) Differentiate between syntactic web and semantic web.

(4 marks)

(b) The explosive growth of the Web has led to the problem of information overload. Explain the term "information overload".

(6 marks)

Q2 (a) Consider the following Extensible Markup Language (XML) document :

```
<?xml version="1.0"?>
<!DOCTYPE list SYSTEM "simple_recipe.dtd">
<list>
<recipe>
  <author>Fitriyyah Zahra</author>
  <recipe_name>Chocolate Chip Bars</recipe_name>
  <meal>Dinner</meal>
  <ingredients>
    <item>2/3 C butter</item>
      <item>2 C brown sugar</item>
    <item>1 tsp vanilla</item>
      <item>1 3/4 C unsifted all-purpose flour</item>
    <item>1 1/2 tsp baking powder</item>
    <item>1/2 tsp salt</item>
      <item>3 eggs</item>
    <item>1/2 C chopped nuts</item>
    <item>2 cups (12-oz pkg.) semi-sweet choc. chips</item>
  </ingredients>
  <directions>
      Preheat oven to 350 degrees.
      Melt butter; combine with brown sugar and vanilla in
      large mixing bowl.
      Set aside to cool. Combine flour, baking powder, and
      salt; set aside.
      Add eggs to cooled sugar mixture; beat well.
      Stir in reserved dry ingredients, nuts, and chips.
      Spread in greased 13-by-9-inch pan.
      Bake for 25 to 30 minutes until golden brown; cool.  Cut
      into squares.
  </directions>
 </recipe>
</list>
```

Write a Data Type Definition (DTD) for the above XML document.

(15 marks)

2

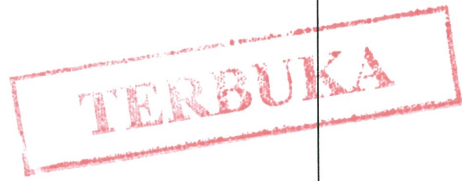(b)   Consider four documents containing an email as follows:

```
Email 1 :

<note date="12/11/2002">
  <to>Tove</to>
  <from>Jani</from>
  <heading>Reminder</heading>
  <body>Don't forget me this weekend!</body>
</note
```

```
Email 2 :

<note>
  <date>12/11/2002</date>
  <to>Tove</to>
  <from>Jani</from>
  <heading>Reminder</heading>
  <body>Don't forget me this weekend!</body>
</note>
```

```
Email 3 :

<note>
  <date>
    <day>12</day>
    <month>11</month>
    <year>2002</year>
  </date>
  <to>Tove</to>
  <from>Jani</from>
  <heading>Reminder</heading>
  <body>Don't forget me this weekend!</body>
</note>
```

```
Email 4 :

<note day="12" month="11" year="2002"
to="Tove" from="Jani" heading="Reminder"
body="Don't forget me this weekend!">
</note>
```

Figure Q2(b)

(i)   Choose the best XML format to store the email information.

(2 marks)

(ii)   Justify your choice in **Q2(b)(i)** based on the arrangement of elements and attributes.

(4 marks)

3

(c)   Change the following XML document into tree representation.

```
<?xml version="1.0" encoding="UTF-16"?>
<!DOCTYPE email SYSTEM "email.dtd">
<email>
      <head>
            <from name="Adni Adam"
                  address = "adniadam@rengit.edu.my"/>
            <to name="Adha Maulud"
                  address="adhamaulud@google.com">
            <subject>  Apa khabar ? </subject>
      </head>
      <body>
      Jangan lupa kirim ole-ole dari sana ya
      </body>
</email>
```

(7 marks)

Q3   Based on the following information:

- The book with title "Semantic Web" and ISBN 280878-10 is written by the author Zahra Fitri.
- The author Adi Adha wrote the books with titles "Modern Web" and "Theory of Semantic".
- The email address of lecturer Adam Adni is adamadni@uthm.edu.my.
- Lecturer Adam Adni has an office in the Department of Web Technology. The office is situated on the 2nd floor of the Computer Building.
- The library is located at UTHM.

(a) Write XML-based RDF.

(6 marks)

(b) Draw a semantic graph for **Q3(a)**.

(6 marks)

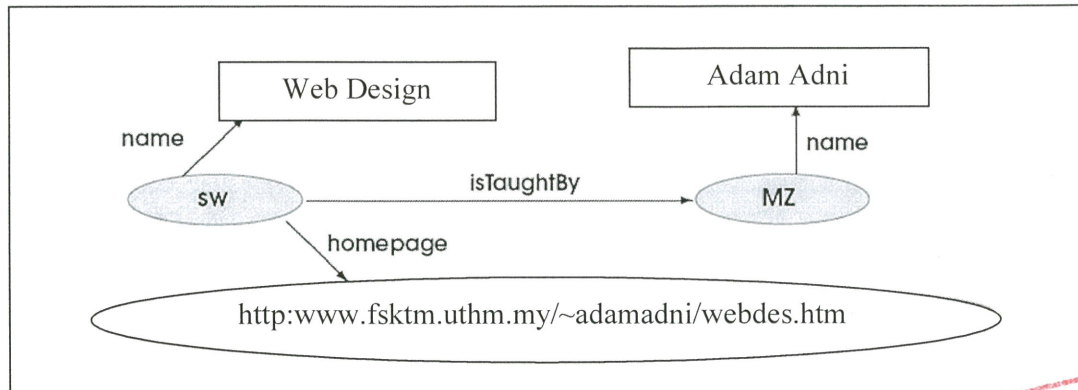**Q4**   Based on **Figure Q4**,

Figure Q4

(a)   Write **FOUR (4)** triples for the above statements.

(4 marks)

(b)   Categorize statements in **Figure Q4** into subject, predicate and object.

(10 marks)

Q5   (a)   Define ontology.

(1 mark)

(b)   Model the following ontologies using OWL :

There are courses and laboratory courses. Assignments are part of courses. Courses are organized by academic staffs. Academic staffs are either lecturers or tutors. Lecturers teach courses while tutors only teach laboratory courses.

(10 marks)

(c)   Based on **Q5(b)**, differentiate OWL syntax with RDF syntax.

(10 marks)

-END OF QUESTION -

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