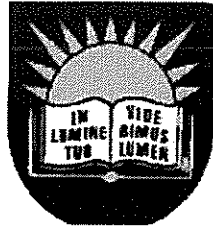


UNIVERSITY OF FORT HARE



Honours Examinations: November 2017

CSC 523: Distributed Web Computing

Time: 3 Hours

Marks: 100

Internal Examiner

Dr. Z.S. Shibeshi

External Examiner

Dr. M. Lall

Instructions:

This paper consists of THREE pages excluding cover page.

No reference material of any kind may be taken into the examination hall.

READ the questions carefully and make sure you understand them well.

There are 14 questions in this assessment, and attempt ALL the questions..

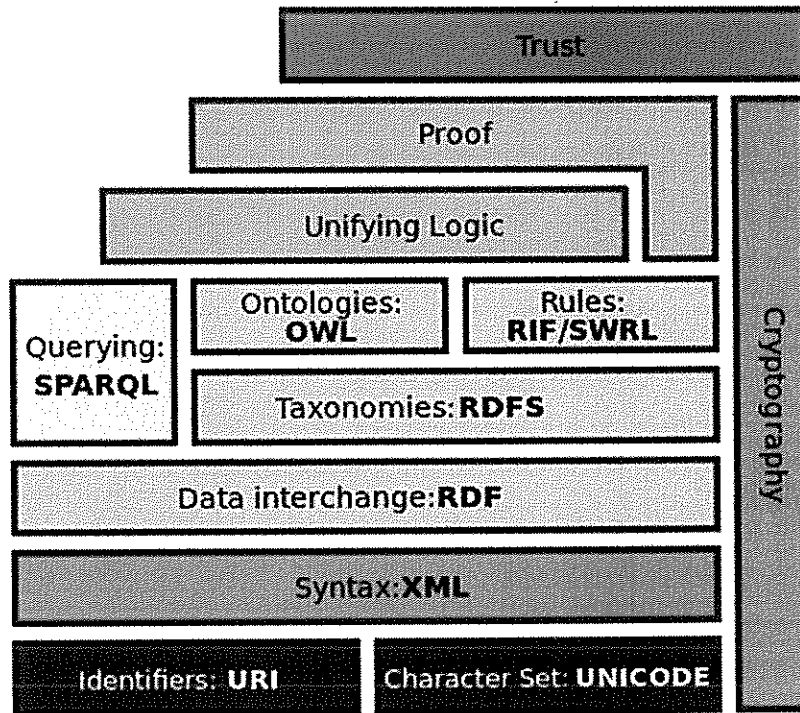
Number your answers correctly as indicated in each question.

Write neatly and clearly.

1. Assume that you are in the process of developing a web service. How do you make your service available to users? Explain the different things you do, and also the steps you follow. Explain what type of protocol and technology involved to achieve this. (4)

2. You are a programmer at XYZ Weather Forecast Co. You are asked to develop a web service that responds with weather information for a requested area. So applications would simply make requests for weather information of a particular area (e.g. Alice) and the web service responds with the weather information (that includes various parameters) as response. For this service you can assume the service will only provide information for parameters: temperature, humidity and wind_speed. The service is online and users are using it. Considering a particular scenario, give a sample SOAP request and response messages for this service, where users provide an area name, like "Alice", and the system will provide weather information (temperature, humidity and wind_speed) for that area. You can provide your own schema and appropriate and meaningful service names if needed. (8)

3. Describe the semantic web stack. (10)



4. Which of the following is (are) URI(s) but not URL? If the item is not a URL give your reason why it is not, and if it is, then explain what type of resource it is referring to. (8)
 - <https://www.facebook.com/suusii.tiyya.5/photos?pnref=lhc>
 - <ftp://ftp.cwi.nl>

- mailto:busi@w3.org
- data.htm

5. Write a code fragment to search for an Agent that provides current temperature information whose service description is “weather” from the Directory Facilitator. (6)

6. What is the difference between the current web and semantic web? Identify at least three differences. (6)

7. Consider the following HTML code.

```
<div>
<p> Gordon Brown </ p>
<p> Email:<a href="mailto:gbrown@number10 .com">
gb@number10 .com< / a>
</ p></ div>
```

Markup the HTML code in RDF using the following properties defined in the foaf namespace: foaf:Person, foaf:name, foaf:mbox. (6)

8. The following example consists of a sequence of RDF statements using the **triples** model.

(“CSC1234”, http://myname.ac.za/is_taught_by, “Zikhona Mandela”)

(“Zikhona Mandela”, http://myname.ac.za/job_title, ”Lecturer”)

(“Zikhona Mandela”, http://myname.ac.za/adopts, “RDF Without Tears”)

(“RDF Without Tears”, http://myname.ac.za/author, “Zizi Smart”)

(i) Explain what information is encoded in these statements, assuming a reasonable interpretation of their constituents. Why do the statements include URLs?

Draw a **graphical** representation of the above statements. (8)

9. What are software agents? How do agents communicate with each other? Explain the different Agent behaviours. (4)

10. Explain the following terms related to the JADE Agent framework: (10)

- Agent Management System (AMS)
- Directory Facilitator
- Host
- Platform
- Container

11. Using the table below, please classify the items in the first column as a violation of the security goals listed in the second column: (8)

(i) A copies B's homework	(A) confidentiality
(ii) A crashes B's operating system	(B) integrity
(iii) A changes the amount on B's check from 100 to 1000	(C) availability
(vi) A does not honor the contract between him/her and B	(D) non-repudiation

12. Write a java program, that, given a key and original text, will cipher the text using Ceasar Cipher and with key equal to "left shift 3 places". Give the mathematical formula of the ceasar cipher (Hint: assume the alphabets having index one to twenty six). (10)

13. Explain diagrammatically how public key cryptography can be used for confidentiality and authentication purposes. (6)

14. What is SQL injection? Explain in detail using an example. (6)