1. [2 Marks] Suppose a user requests an html page from the server with 3 embedded images. How many TCP connections need to be opened for HTTP/1.0 compared HTTP/1.1?

A. The major difference between the standards is 1.0 is a 'non-persistent', per request connection where 1.1 opens and keeps open a TCP connection for handle all requests.
Therefore, as there are 4 sources, html file and 3 images; 1.0 will open 4 TCP connections and 1.1 only 1.

3. [1 Mark] Why are there dots in a domain name, ie. vuw.ac.nz. ?

A. A domain name is an identification string, comprised of multiple 'labels' representing a hierarchical structure of hosts (sub domains), and these are delimited with (seperated) dots.
Ie. in the above example there are 3 subdomains, [vuw, ac, nz], with ***nz*** being the top level etc.

4. [1 Mark] Why do most Domain name servers reject recursive queries?

A. Recursive DNS requests have a higher performance cost on the name server(s) and also leave the server vulnerable to facilitate a *DNS Amplification Attack. As a result, Network administrators who detect these requests may block said IP, as it may be spoofed.*

5. [1 Marks] Create an XML document for a pet database. It should contain the following data, [name, species, fuzziness]. For example, a turtle named Bruce, would have the data [Bruce, Turtle, Not fuzzy].

```xml
<?xml version="1.0" encoding="utf-8" ?>
<PetList>
    <Pet>
        <Name>Marbles</Name>
        <Species>Dog</Species>
        <Fuzziness>moderate</Fuzziness>
    </Pet>
    <Pet>
        <Name>Kermit</Name>
        <Species>Dog</Species>
        <Fuzziness>low</Fuzziness>
    </Pet>
    <Pet>
        <Name>Peach</Name>
        <Species>Dog</Species>
        <Fuzziness>low</Fuzziness>
    </Pet>
    <Pet>
        <Name>Ad</Name>
        <Species>Hamster</Species>
        <Fuzziness>high</Fuzziness>
    </Pet>
    <Pet>
        <Name>Bunny</Name>
        <Species>Dog</Species>
        <Fuzziness>low</Fuzziness>
    </Pet>
</PetList>
```

6. [2 Marks] Write an XML schema for question 5.

```
<?xml version="1.0" encoding="utf-8" ?>
<xs:schema targetNamespace="http://www.example.com/xml/Schema"
        xmlns:xs="http://www.w3.org/2001/XMLSchema"
        xmlns="http://www.example.com/xml/Schema">a
  <xs:element name="PetList">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Pet" maxOccurs="unbounded" minOccurs="0">
          <xs:complexType>
            <xs:sequence>
              <xs:element type="xs:string" name="Name"/>
              <xs:element type="xs:string" name="Species"/>
              <xs:element type="xs:string" name="Fuzziness"/>
            </xs:sequence>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

7. [3 Marks] Write a WSDL document to describe the interface for question 5. It should have operations to set, get and add.

```
<?xml version="1.0" encoding="utf-8" ?>
<definitions name="PetDataBase"
        targetNamespace="http://schemas.xmlsoap.org/wsdl/"
        xmlns="http://schemas.xmlsoap.org/wsdl/">
        <types></types>
        <message name="PetInfo">
                <part type="xs:string" name="Name"/>
                <part type="xs:string" name="Species"/>
                <part type="xs:string" name="Fuzziness"/>
        </message>
        <message name="GetData">
                <part type="xs:string" name="Name"/>
        </message>
        <portType name="PetDataBasePort">
                <operation name="set">
                        <input name="NewData" message="PetInfo"/>
                </operation>
                <operation name="add">
                        <input name="NewPet" message="PetInfo"/>
                </operation>
                <operation name="get">
                        <input name="Name" message="GetData"/>
                        <output name="Pet" message="PetInfo"/>
                </operation>
        </portType>
</definitions>
```