

## Model Answer:

Q1:

- *hasFriend* (Symmetric, Irreflexive)
- *hasBrother* (Symmetric, Transitive, Irreflexive)
- *love* (none)
- *hasMother* (Functional, Irreflexive, Asymmetric)
- *hasDescendent* (Transitive, Irreflexive, Asymmetric)
- *knows* (Reflexive)
- *hasMaleSibling* (Symmetric, Transitive, Irreflexive)
- *hasEmail* (InversedFunctional)
- *hasDateOfBirth* (Functional)
- *isOlderThan* (Transitive, Irreflexive, Asymmetric)
- *hasDNAFingerprint* (Functional, InverseFunctional)

Q2:

- (a) False
- (b) True
- (c) True
- (d) False
- (e) True
- (f) False
- (g) True
- (h) False
- (i) False
- (j) True

Q3:

```
<owl:Class rdf:about="OntoDeveloper">
  <rdfs:subClassOf>
    <owl:Restriction>
      <owl:onProperty rdf:resource="knows"/>
      <owl:someValuesFrom rdf:resource="OntologyLanguage"/>
    </owl:Restriction>
  </rdfs:subClassOf>
</owl:Class>
```

```
<owl:Class rdf:about="VeggieSandwich">
  <rdfs:subClassOf>
    <owl:Restriction>
      <owl:onProperty rdf:resource="hasIngredient"/>
      <owl:allValuesFrom rdf:resource="MeatFreeIngredient"/>
    </owl:Restriction>
  </rdfs:subClassOf>
</owl:Class>
```

```

<owl:Class rdf:about="UKPriceTag">
  <rdfs:subClassOf>
    <owl:Restriction>
      <owl:onProperty rdf:resource="hasCurrency"/>
      <owl:hasValue rdf:resource="GBP"/>
    </owl:Restriction>
  </rdfs:subClassOf>
</owl:Class>

<owl:Class rdf:about="Bicycle">
  <rdfs:subClassOf>
    <owl:Restriction>
      <owl:onProperty rdf:resource="hasWheel"/>
      <owl:minCardinality
rdf:datatype="http://www.w3.org/2001/XMLSchema#nonNegativeInteger">2</owl:minCardi
nality>
      </owl:Restriction>
    </rdfs:subClassOf>
  </owl:Class>

<owl:Class rdf:about="Mother">
  <owl:equivalentClass>
    <owl:Class>
      <owl:intersectionOf rdf:parseType="Collection">
        <rdf:Description rdf:about="Woman"/>
        <owl:Restriction>
          <owl:onProperty rdf:resource="hasChild"/>
          <owl:someValuesFrom rdf:resource="Person"/>
        </owl:Restriction>
      </owl:intersectionOf>
    </owl:Class>
  </owl:equivalentClass>
  <rdfs:subClassOf rdf:resource="Person"/>
</owl:Class>

```