1.

<!ELEMENT Customers (person)\*>

<!ELEMENT person (name, age?, gender?, hobby\*)>

<!ELEMENT name (first\_name, last\_name)

<!ELEMENT first\_name (#PCDATA)>

<!ELEMENT last\_name (#PCDATA)>

<!ELEMENT age (#PCDATA)>

<!ELEMENT gender (#PCDATA)>

<!ELEMENT hobby (#PCDATA)>

2.

1. <hobby>Jogging</hobby>

<hobby>Swim </hobby>

<hobby>Reading</hobby>42

1. <age>42</age>
2. No match

3.

Solution to the query:

[

{"Name": "John", "Quantity": 1.5},

{"Name": "Mary", "Quantity": 2.0}

]

This is just an array of JSON formatted objects though (although valid JSON as it is). Perhaps we were asked to give an answer like the following though:

{"result": [

{"Name": "John", "Quantity": 1.5},

{"Name": "Mary", "Quantity": 2.0}

]}

4.

1. for $x in /bookstore/book

where $x/price>30

return $x/title

1. for $x in /bookstore/book/title

order by $x

return $x

1. for $x in //book

where $x/year > 1991 and $x/price > 39.95

return ($x/year, $x/title)

1. for $x in //book

where count($x/author) >= 3

return $x/title