1. (10 points) Identify all of the following statements that are true about the basic Web services standards.
   A. WSDL can specify that an operation produces no results
   B. UDDI provides an easy way to formally express the meanings of services
   C. UDDI registries are logically centralized but may be distributed in implementation
   D. A UDDI registry may itself be understood as a Web service
   E. SOAP may not be simple, but its inclusion of conversations has led most vendors to support it

   Solution: A, C, D

2. (16 points) Identify all of the following statements that are true about RDF
   A. In a well-formed RDF document, the domain and range of each property must be explicitly listed
   B. In a well-formed RDF document, each property must have no more than one domain and no more than one range
   C. Because each triple relates at most two parties, it is impossible to express three-party relationships in RDF
   D. Statements can be reified in RDF
   E. Reification means stating properties about properties
   F. Reification is essential for creating cyclic models or graphs in RDF
   G. OWL is an example of a vocabulary created using RDF and RDF Schema
   H. A major difference between RDF and OWL is that OWL assertions about a URI can be assembled from multiple documents, but RDF assertions about a URI must come from one document

   Solution: D, G

3. (16 points) Listing 1 is an instance document based on an OWL ontology in which Rule is declared as a owl:Class. Identify all of the following statements about the underlying ontology that are correct based on this instance document.

   Listing 1: A trivial rule for handling an exception

   ```xml
   <Rule rdf:ID="business-exception-1">  
     <Condition>  
       <Term rdf:ID="missing-books">  
         <Test rdf:datatype="&xsd;#string">missing</Test>  
         <onWhat rdf:datatype="&xsd;#string">books</onWhat>  
       </Term>  
     </Condition>  
     <Action>  
       <Sequence rdf:ID="remind+reorder">  
         <Step rdf:datatype="&xsd;#string">remind</Step>  
         <Step rdf:datatype="&xsd;#string">  
       </Sequence>  
     </Action>  
   </Rule>
   ```
A. We can infer an owl:Class assertion whose rdf:ID is ‘Rule’
B. Rule is a subclass of Term
C. Term is a union of Test and onWhat
D. onWhat is a datatype property
E. Sequence is a class
F. Condition is an object property
G. If we place the Condition element after the Action element, there is no change to the meaning
H. Step is a functional property

Solution: A, D, E, F, G