1. (16 points) Of the following statements, identify all that hold about XSLT.

    A. When processing an element for which no matching pattern is specified, XSLT invokes xsl:apply-templates by default on the elements, text, and attributes that occur within that element

    B. One of the default XSLT behaviors is to copy a text node to the output

    C. If an XSLT parameter is unspecified during invocation, it is treated as having the empty set as its value

    D. An XSLT processor can produce unpredictable results if additional parameters are supplied (that aren't defined in the given template)

    E. A major weakness of XSLT is that it prevents writing transformations that operate in a recursive manner

    F. In XSLT, you cannot invoke a template on the parent of the current node because that would lead to nontermination

    G. In XSLT, you can invoke a template on a sibling of the current node

    H. For every correct XSLT transform that produces a document of schema Y from a document of schema X, you can define an inverse transform that produces a document of schema X from a document of schema Y

    > **Solution:** B, C, G
    >
    > A is false because there is no recursion on the attributes
    >
    > H is false because in general you cannot invert a transformation: take a large purchase order and extract the price; from the price you can't reconstruct the original purchase order

2. (10 points) Of the following statements, identify all that hold about keys in XML Schema.

    A. When specifying a schema, we should specify key or unique constraints on all element types for which such constraints make sense

    B. The current XML standards do not support referential integrity

    C. A key can have as many selectors and fields as necessary

    D. Keys can address XML content down to an individual attribute

    E. A common design pattern for keys involves selecting the fields from the next sibling

    > **Solution:** D because field can include attributes
    >
    > A is false because the constraints are not on element *types*

3. (10 points) Of the following statements, identify all that hold about concepts relating to XML.

    A. The Document Object Model (DOM) for parsing XML documents is popular in industry because of its performance characteristics

    B. Mixed content is allowed in XML primarily to support the data-centric view

    C. In the document-centric view, a relational DBMS is an essential architectural component

    D. In XML, we can write the null value for an element called item we wish to specify as <item/>

    E. XML has won its competition in most IT areas because it provides unique, standardized representations of information

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Solution: None

A is false because DOM is notoriously slow (as a result of its creating a tree entire from an entire document before anything useful can be done)

B is false because mixed content suits the document-centric view

C is false the document-centric view requires an XML store rather than a relational DBMS

D is false because `<item/>` is not null; `<item xsi:nil="true"/>` is the XML convention for null

E is false because XML does not provide unique, standardized representations of information: as dicussed in class, you can have many document (schemas) with the same intended meaning

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4. (16 points) Of the following statements, identify all that hold about XML and relational databases.

   A. SQL/XML involves a new datatype for capturing XML content

   B. SQL/XML mapping rules include mapping standard SQL datatypes to XML Schema datatypes

   C. SQL/XML's publishing functions are templates that go into the SELECT part of an SQL query

   D. SQL/XML uses syntax similar to XPath's, but its meaning is entirely different from the standard XPath

   E. The main limitation of XQuery and SQL/XML is that they don't allow modifications to the data

   F. Creating a shallow representation (in a relational schema) of an XML document involves choosing a tuple-generating element from the XML document

   G. The three legs of modern information systems are tuples, objects, and queries

   H. Mapping relations to XML documents is a lot easier than mapping XML documents to relations

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Solution: A, B, C, F, H

G is false because it should be tuples, objects, and documents

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