1. (4 marks) Find all errors in the XML document. Indicate if the error violates the document being valid or well-formed.

<!DOCTYPE OrderDB [

<!ELEMENT OrderDB(Order\*, Customer+, Product+)>

<!ELEMENT Order(LineItem+, totalAmount?)>

<!ATTLIST Order orderId ID #REQUIRED>

<!ATTLIST Order customerId IDREF #IMPLIED>

<!ELEMENT totalAmount(#PCDATA)>

<!ELEMENT LineItem(quantity, price)>

<!ATTLIST LineItem productId IDREF #REQUIRED>

<!ELEMENT quantity(#PCDATA)>

<!ELEMENT price(#PCDATA)>

<!ELEMENT Customer(cname, address?)>

<!ATTLIST Customer customerId ID #REQUIRED>

<!ELEMENT cname(#PCDATA)>

<!ELEMENT address(#PCDATA)>

<!ELEMENT Product(pname, category, price)>

<!ATTLIST Product productId ID #REQUIRED>

<!ELEMENT pname(#PCDATA)>

<!ELEMENT category(#PCDATA)>

<!ELEMENT price(#PCDATA)>

]>

<?xml version="1.0" standalone="no"?>

<!DOCTYPE OrderDB SYSTEM "OrderDB.dtd">

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<Order orderId = "ord1" customerId = "cust1">

<LineItem productId = "prod1"><quantity>5</quantity><price>5.00</price></LineItem>

<LineItem productId = "prod2"><quantity>1</quantity><price>22.00</price></LineItem>

<totalAmount>47.00</totalAmount>

</Order>

<Order orderId = "ord2>

<LineItem productId = "prod1"><price>25.00</price><quantity>1</quantity></LineItem>

<totalAmount>24.00</totalAmount>

</Order>

<Order orderId = "ord3" customerId = "cust1">

<LineItem productId = "prod1"><quantity>2</quantity><price>50.00</LineItem>

</Order>

<Customer customerId = "cust1">

<cname>Joe Smith</cname>

</Customer>

<Customer customerId = "2">

<cname>Steve Stone</cname>

<address>134 Neverland Ave.</address>

<numOrders>1</numOrders>

</Customer>

<Product>

<pname>Soap</pname>

<category>Personal Hygiene</category>

<price>5.00</price>

</Product>

<Product productId = "prod2">

<pname>Electric Toothbrush</pname>

<price>25.00</price>

</Product>

\_\_\_\_\_\_\_

Errors are highlighted above

|  |  |
| --- | --- |
| Error | Type |
| Missing root element (<OrderDB></OrderDB>) | Well-formed Error |
| Missing closing “ for ord2 ID attribute | Well-formed Error |
| price and quantity tags are swapped from DTD | Valid Error |
| No closing </price> for order 3 | Well-formed Error |
| Customer id cannot be “2” needs to start with a letter (“cust2”) | Valid Error |
| <numOrders> is not valid according to DTD | Valid Error |
| No productId attribute for product 1 | Valid Error |
| No category element for product 2 | Valid Error |

1. (2 marks) Write a XPath query that returns all products whose price is $10.

/OrderDB/Product[price=10]

1. (2 marks) Write a XPath query that returns all order information for customer with id = "cust1".

/OrderDB/Customer[@customerId=”cust1”]

1. (2 marks) Write a XPath query that returns the order ids where the order has totalAmount > $20 and contains the product with id = "prod1".

/OrderDB/Order[totalAmount>20]/LineItem[@productId=”prod1”]/../@orderId