Pediatric XML Database Exam with Qt

Healthcare IT Instructor

Duration: 60 minutes

Instructions

- Complete all 5 exercises using Qt's XML DOM API
- Write code directly in the provided spaces
- All XML must be well-formed
- Focus on pediatric healthcare data scenarios

Exercise 1: Database Creation (15 points)

Design an XML database schema for a pediatric clinic with:

- Patients (ID, name, birthdate, blood_type)
- Vaccinations (vaccine_name, date, dose)
- Growth records (height, weight, date)

```
QDomDocument doc;
// Create root element and structure here
```

Exercise 2: Data Insertion (20 points)

Add this patient record to your database:

```xml
<patient id="P1001">
  <name>Lina Marzouki</name>
  <birthdate>2020-05-12</birthdate>
  <blood_type>O+</blood_type>
  <vaccinations>
    <vaccine name="DTaP" date="2021-03-10" dose="1"/>
  </vaccinations>
</patient>

// Your Qt DOM implementation here
```

Exercise 3: Query & Update (20 points)

(a) Find all patients missing measles vaccine (no `<vaccine name="MMR">`)

(b) Update Lina's record with new growth data:

```xml
<growth height="75.2" weight="9.1" date="2023-09-01"/>
```

Exercise 4: Error Handling (15 points)

Fix and safely load this malformed XML:

```
<patient id=P2001>
  <name>Youssef Khan
  <vaccinations>
</clinic>
```

Exercise 5: Reporting (30 points)

Generate a vaccination report:

```
<report date="2023-09-15">
  <patient id="P1001">
    <next_vaccine>MMR</next_vaccine>
    <last_height>75.2</last_height>
  </patient>
</report>
```

Grading Rubric

Exercise	Evaluation Criteria
1	Correct XML hierarchy and Qt implementation
2	Proper DOM node creation and insertion
3	Accurate query logic and update operations
4	Robust error handling and recovery
5	Complete report generation with calculations

Total Points: 100
Passing Score: 70