Part 1: true or false
correct = +1
wrong = -1
no answer = 0

Q1: On the subject position of an RDF triple, any RDF term is allowed.

Q2: In SPARQL queries, SELECT DISTINCT filters out duplicate solution mappings.

Q3: ASK queries return an RDF graph.

Q4: SPARQL queries are always translated into SQL and then executed on a relational database.

Q5: In a SPARQL query, only solutions that match all of the FILTER expressions are returned.

Q6: A resource can only be a member (hint: type) of a single class.

Q7: Blank nodes have URIs.

Q8: Domain and range of properties can be specified in RDFS.

Q9: RDFS is more expressive than OWL.

Q10: In OWL, the range of object properties are instances of classes.

Q11: The result type of a CONSTRUCT query is an RDF graph or triple.

Q12: SPARQL Is primarily a query language for relational databases.

Q13: The result type of an ASK query is a Boolean.

Q14: Evaluating a SPARQL query with entailment regimes can result in more results.

Q15: A SPARQL query can only be evaluated on the default graph.

Q16. SHACL is mainly targeted at XML.

Q17: RML is a superset of R2RML.

Q18: R2RML allows to specify XML sources.

Q19: RDFS is a way to specify ontologies.

Q20: OWL is based on a form of logic.

Part 2: open questions, 4 points each

Q21/22. Assume that based on the data provided on DBpedia, you want to retrieve information about music. Consider the following example data from DBpedia about "Taylor Swift", This is just a small sample of all the data about music to be found in DBedia. However, the example provides an insight on how the data is modeled and represented.

```
@prefix dbp: <http://dbpedia. org/property/>
@prefix dbr: <http://dbpedia.org/resource/>
```

```
@prefix dbo: <http://dbpedia.org/ontology/>
@prefix dbd: <http://dbpedia.org/datatype/>
@prefix rdf:  <http://www.w3.0rg/1999/02/22-rdf-syntax-ns#>
@prefix schema: <http://schena.org/>
@prefix foaf: <http://xmlns.com/foaf/0.1/>
@prefix xsd: <http://www.w3.org/2001/XMLSchema#>

dbr: Taylor_Swift
    rdfs:label
        "Taylor Swift"@de ,
        "Taylor Swift »@es ,
        "Taylor Swift"@pl,
        "Taylor Swift »@pt ;
    rdf: type
        dbo: Artist,
        dbo:MusicalArtist;
    dbp: genre
        dbr: Pop_music ;
        dbr:Country_music ;
    dbp: instrument
        "piano"@en ,
        "banjo"@en ,
        "ukulele"@en ,
        "guitar"@en ,
        "Vocals"@en ;
    dbp: yearsActive
        2004 ;
    dbo: birthDate
        « 1989-12-13 »^^xsd:date ;
    foaf: name
        "Taylor Swift"@en ;
    foaf: homepage
        <http://taylorswift.com>·

dbr: 1989_ (Taylor Swift_album)
    dbp: artist
        dbr:Taylor_Switt i
    foaf: name
        1989"@en ;
    rdf: type
        schema: MusicAlbum ,
        dbo: Album;
    dbp: released
        "2014-10-27"^^xsd: date ;
    dbp: salesamount
        "5124000"^^xsd:integer

dbr: Blank_Space
    dbo: album
```

```
        dbr: 1989_ (Taylor_Swift_albun) ;
    dbp: writer
        dbr: Max_Martin ;
    foaf: name
        "Blank Space"@en;
    dbo: runtime
        231.0 . #Runtime in second
```

Assume that all data on music is stored in the *Default Graph* in the SPARQL engine. Further assume that the prefixes that are used in the graph are also defined for the SPARQL engine, i.e., start your solution directly with "SELECT ... ". Write SPARQL queries for the following tasks.

Q21. Return the IRIs of all pop artists. (Hint: genre)

Q22. Return the names of albums and their release dates. (Hint: album)

Q23. Given the following shape graph:

```
ex:PersonShape rdf:type sh:NodeShape
ex:PersonShape sh:targetclass ex:Person .
ex:PersonShape sh:property [
    rdf:type sh:PropertyShape ;
    sh:path ex:ssn ;
    sh:maxCount 1 ].
```

Please provide an example data graph, i.e., a set of RDF triples, where (i) at least one entity/ resource/node is valid with respect to the given constraints and (ii) at least one entity/resource/node violates the highlighted constraint but fulfills the others specified in the shape graph.

Q24. Consider the following OWL statements:

```
:Film a owl:Class .
:Movie a owl:Class
:ActionMovie a owl:Class ;
    rdfs:subClassOf :Film .
:Film a owl:Class ;
    rdfs:subclassof :Creativework .
:Film owl:equivalentclass :Movie .
```

List at least two OWL statements (not already listed above) that are entailed by the above.

Q25. Consider the following R2RML mapping:

```
@prefix rr: <http://www.w3.org/ns/r2rml#> .
@prefix foaf: <http://xmlns.com/foaf/0.1/>
<TriplesMap1>
```

```
    a rr: TriplesMap;
    rr: logicalTable [ rr: tableName "Person"];
    rr: subjectMap [
        rr: template "http://www.ex.com/Person/{ID}";
        rr:class foaf: Person
    ];
    rr: predicateObjectMap [
        rr:predicate foaf:name ;
        rr:objectMap [rr:column "NAME" ]
    ].
```

And consider the following table:

Person			
ID	NAME	DEP	REF
10	Claire	A	A1
20	Dave	B	A1

Complete the output of this mapping in Turtle syntax.

```
@prefix ex: < http://www.ex.com/>  .
@prefix foaf: <http://xmlns.com/foaf/0.1/>  .
```