Q1.

a.

$\prod$ name(σ dept_name = Comp.Sci ^ semester = Spring ^ year = 2009 (teaches $\bowtie$ teaches.ID = instructor.ID instructor))

b.

G min(average_salary)dept_name (dept_name G avg(salary) as average_salary , depart_name (instructors))

Q2.

Books(isbn, title, author, publisher)
Accession(accessionno, isbn)
Users(userid, name, deptid)
Departs(deptid, deptname)

Q3.

a.

```
db.inventory.find({
        $ and : [{"size.h" : {$lt : 25}}, {"size.uom":"in"}]}, {item : 1, qty:1}).sort({qty: -1}
})
```

b.

```
db.inventory.aggregate([
        {$match: {qty: {$gt:50}}},
        { $sort: {"status":1}}, { $group: {_id: {status: "$status"}, totalAmt : {$sum: "$qty"}}}
])
```

Q4.

a.

```
db.inventory.find({instock: {$elemMatch: {warehouse: "A", qty: {$gt: 30}}}})
```

b.

```
db.inventory.find({"instock.0.qty": {$gt : 30} })
```

c.

```
db.inventory.find({instock: {$size: 1}})
```