To create the "BSIOTR" database and the specified collections in MongoDB and perform the requested operations, you can use the MongoDB shell. Here are the steps to achieve the tasks:

1. Open the MongoDB shell.

2. Create the "BSIOTR" database:

```javascript

use BSIOTR

```

3. Create the "Teachers" and "Students" collections:

```javascript

db.createCollection("Teachers")

db.createCollection("Students")

```

4. Insert sample data into the "Teachers" and "Students" collections:

```javascript

db.Teachers.insertMany([

{

Tname: "John",

dno: 1,

dname: "Computer",

experience: 5,

salary: 12000,

date\_of\_joining: ISODate("2022-01-15T00:00:00Z")

},

{

Tname: "Mary",

dno: 2,

dname: "IT",

experience: 7,

salary: 13000,

date\_of\_joining: ISODate("2021-09-20T00:00:00Z")

},

{

Tname: "Praveen",

dno: 3,

dname: "E&TC",

experience: 3,

salary: 9500,

date\_of\_joining: ISODate("2023-03-10T00:00:00Z")

}

])

db.Students.insertMany([

{

Sname: "Alice",

roll\_no: 1,

class: "10A"

},

{

Sname: "Bob",

roll\_no: 2,

class: "11B"

},

{

Sname: "Charlie",

roll\_no: 3,

class: "12C"

}

])

```

Now, you can perform the requested operations:

1. Find all teachers:

```javascript

db.Teachers.find()

```

2. Find teachers of the Computer department:

```javascript

db.Teachers.find({ dname: "Computer" })

```

3. Find teachers of Computer, IT, and E&TC departments:

```javascript

db.Teachers.find({ dname: { $in: ["Computer", "IT", "E&TC"] } })

```

4. Find teachers with salary greater than or equal to 10,000 in specified departments:

```javascript

db.Teachers.find({

dname: { $in: ["Computer", "IT", "E&TC"] },

salary: { $gte: 10000 }

})

```

5. Find students with roll\_no equal to 2 or Sname equal to "xyz":

```javascript

db.Students.find({ $or: [{ roll\_no: 2 }, { Sname: "xyz" }] })

```

6. Update Praveen's experience to 10 years or insert a new entry if not found:

```javascript

db.Teachers.update(

{ Tname: "Praveen" },

{

$set: {

experience: 10,

dname: "NewDept" // New entry with updated values

}

},

{ upsert: true }

)

```

7. Update department to "COMP" for all teachers in the IT department:

```javascript

db.Teachers.updateMany({ dname: "IT" }, { $set: { dname: "COMP" } })

```

8. Find teachers' names and their experience:

```javascript

db.Teachers.find({}, { \_id: 0, Tname: 1, experience: 1 })

```

9. Insert a new entry into the "Department" collection using `save()`:

```javascript

db.Department.save({ dept\_name: "NewDept", location: "LocationXYZ" })

```

10. Change the department of teacher Rajesh to IT using `save()`:

```javascript

db.Teachers.update(

{ Tname: "Rajesh" },

{

$set: {

dname: "IT"

}

}

)

11. Delete all documents from the "Teachers" collection with IT department:

```javascript

db.Teachers.deleteMany({ dname: "IT" })

```

12. Display the first 3 documents in the "Teachers" collection in ascending order:

```javascript

db.Teachers.find().sort({ Tname: 1 }).limit(3)

```

These are the MongoDB shell commands to perform the requested tasks in the "BSIOTR" database with the "Teachers" and "Students" collections.