**Program 8a:**

1. db.createCollection(‘student’)
2. db.student.insertMany([

{\_id: 1, Name: 'xyz', Branch: 'AIML', USN: 37, Age: 19 },

{ \_id: 2, Name: 'sam', Branch: 'CSE', USN: 49, Age: 20 },

{ \_id: 3, Name: 'Jack', Branch: 'Mech', USN: 48, Age: 21 },

{ \_id: 4, Name: 'Viola', Branch: 'AIML', USN: 60, Age: 22 }

{\_id:5,Name:’pqr’,Branch:’AIML’,USN:50,Age:25,grades:[24,34,45,67]} #multikey Index

{\_id:6,Name:’uv’,Course:’cse’,Age:50} #sparse Index

1. creating Index(single field,compound,unique,multikey,sparse)
2. db.student.createIndex({Name:1})# Single Field Index
3. db.student.createIndex({Branch:1,age:-1})# Compond Index
4. db.student.createIndex({USN:1},{unique:true}) #unique index
5. db.student.createIndex({course:1},{sparse:true})# sparse index
6. db.student.createIndex({grades:1}) # multikey index

**program 8B:**

1. Query Optimization(hint(),explain())
2. Single index

db.student.find({Name:'Jack'}).hint({Name:1})

db.student.find({Name:'Jack'}).explain

1. Unique index

db.student.find({USN:48}).hint({USN:1})

db.student.find({USN:48}).explain()