①INSTANCE MANAGEMENT COMMANDS

Create Cloud SQL Instance

MySQL

```
gcloud sql instances create mysql-inst \
--database-version=MYSQL_8_0 \
--cpu=2 \
--memory=8GB \
--region=asia-south1 \
--storage-type=SSD \
--storage-size=100GB \
--availability-type=REGIONAL
```

PostgreSQL

```
gcloud sql instances create pg-inst \
--database-version=POSTGRES_14 \
--cpu=4 \
--memory=16GB \
--region=asia-south1 \
--storage-type=SSD \
--availability-type=REGIONAL
```

SQL Server

```
gcloud sql instances create sqlserver-inst \
--database-version=SQLSERVER_2019_STANDARD \
--cpu=4 \
--memory=16GB \
--region=asia-south1
```

List Instances

```
gcloud sql instances list
```

Describe Instance

```
gcloud sql instances describe pg-inst
```

Start / Stop Instance

```
gcloud sql instances patch pg-inst --activation-policy=ALWAYS
gcloud sql instances patch pg-inst --activation-policy=NEVER
```

Delete Instance

```
gcloud sql instances delete pg-inst
```

---

2 DATABASE COMMANDS

Create Database

```
gcloud sql databases create salesdb \
--instance=pg-inst
```

List Databases

```
gcloud sql databases list --instance=pg-inst
```

Delete Database

```
gcloud sql databases delete salesdb \
```

```
--instance=pg-inst
```

---

3 USER MANAGEMENT COMMANDS

Create User

```
gcloud sql users create appuser \
--instance=pg-inst \
--password=Strong@123
```

List Users

```
gcloud sql users list --instance=pg-inst
```

Change Password

```
gcloud sql users set-password appuser \
--instance=pg-inst \
--password=NewStrong@123
```

Delete User

```
gcloud sql users delete appuser \
--instance=pg-inst
```

---

4 BACKUP & RECOVERY COMMANDS

List Backups

```
gcloud sql backups list --instance=pg-inst
```

Create On-Demand Backup

```
gcloud sql backups create --instance=pg-inst
```

Restore Backup

```
gcloud sql backups restore BACKUP_ID \
--restore-instance=pg-inst
```

---

5 IMPORT & EXPORT COMMANDS (🔥 VERY IMPORTANT)

Export SQL Dump to GCS

```
gcloud sql export sql pg-inst \
gs://my-bucket/backup.sql
```

Import SQL Dump from GCS

```
gcloud sql import sql pg-inst \
gs://my-bucket/backup.sql
```

Import CSV into Table

```
gcloud sql import csv pg-inst \
gs://my-bucket/orders.csv \
--database=salesdb \
```

```
--table=orders
```

Export Table as CSV

```
gcloud sql export csv pg-inst \
gs://my-bucket/orders.csv \
--database=salesdb \
--query="SELECT * FROM orders"
```

6 REPLICA & HA COMMANDS

Create Read Replica

```
gcloud sql instances create pg-replica \
--master-instance-name=pg-inst \
--region=asia-south1
```

Promote Read Replica

```
gcloud sql instances promote-replica pg-replica
```

Failover (HA)

```
gcloud sql instances failover pg-inst
```

7 CONNECTIVITY & SECURITY COMMANDS

Assign Public IP

```
gcloud sql instances patch pg-inst \
--assign-ip
```

Enable Private IP

```
gcloud sql instances patch pg-inst \
--network=default \
--no-assign-ip
```

Authorize Network (Public IP)

```
gcloud sql instances patch pg-inst \
--authorized-networks=203.0.113.10/32
```

Create SSL Client Certificate

```
gcloud sql ssl client-certs create client-cert pg-inst
```

List SSL Certificates

```
gcloud sql ssl client-certs list --instance=pg-inst
```

Delete SSL Certificate

```
gcloud sql ssl client-certs delete CERT_NAME \
--instance=pg-inst
```

8 MAINTENANCE & PATCHING

Set Maintenance Window

```
gcloud sql instances patch pg-inst \
--maintenance-window-day=7 \
--maintenance-window-hour=3
```

---

9 STORAGE & PERFORMANCE

Increase Disk Size

```
gcloud sql instances patch pg-inst \
--storage-size=200GB
```

Enable Automatic Storage Increase

```
gcloud sql instances patch pg-inst \
--storage-auto-increase
```

---

10 IAM & ACCESS CONTROL (CLI + IAM)

Grant Cloud SQL Client Role

```
gcloud projects add-iam-policy-binding my-project \
--member="serviceAccount:app-sa@my-project.iam.gserviceaccount.com" \
--role="roles/cloudsql.client"
```

🔢 MONITORING & OPERATIONS

List Operations

```
gcloud sql operations list --instance=pg-inst
```

Describe Operation

```
gcloud sql operations describe OPERATION_ID
```

EXAM QUICK SUMMARY (MEMORIZE)

- `instances create` → create DB server

- `databases create` → create schema

- `users create` → DB login

- `export / import` → GCS based

- `failover` → HA only

- `replica` → read scaling

- `ssl client-certs` → TLS security

INTERVIEW ONE-LINER

Cloud SQL can be fully managed via gcloud commands covering instance lifecycle, security, backups, replication, and data migration.

⓪ BASIC SETUP

```
gcloud config set project <PROJECT_ID>

gcloud auth login
```

---

① INSTANCE MANAGEMENT

Create Instance

```
gcloud sql instances create my-sql \

--database-version=POSTGRES_14 \

--cpu=4 \

--memory=16GB \

--region=asia-south1 \

--storage-type=SSD \

--storage-size=100GB \

--availability-type=REGIONAL
```

List / Describe

```
gcloud sql instances list
gcloud sql instances describe my-sql
```

Start / Stop

```
gcloud sql instances patch my-sql --activation-policy=ALWAYS
gcloud sql instances patch my-sql --activation-policy=NEVER
```

Delete

```
gcloud sql instances delete my-sql
```

---

2 DATABASE COMMANDS

```
gcloud sql databases create salesdb --instance=my-sql

gcloud sql databases list --instance=my-sql

gcloud sql databases delete salesdb --instance=my-sql
```

---

3 USER MANAGEMENT

```
gcloud sql users create appuser \
--instance=my-sql \
--password=Strong@123


gcloud sql users list --instance=my-sql


gcloud sql users set-password appuser \
--instance=my-sql \
--password=New@123


gcloud sql users delete appuser --instance=my-sql
```

---

4 BACKUPS & RECOVERY

```
gcloud sql backups list --instance=my-sql

gcloud sql backups create --instance=my-sql

gcloud sql backups restore BACKUP_ID \
--restore-instance=my-sql
```

5️⃣ IMPORT / EXPORT (🔥 VERY IMPORTANT)

Export SQL

```
gcloud sql export sql my-sql \
gs://my-bucket/db.sql
```

Import SQL

```
gcloud sql import sql my-sql \
gs://my-bucket/db.sql
```

Import CSV

```
gcloud sql import csv my-sql \
gs://my-bucket/orders.csv \
--database=salesdb \
--table=orders
```

Export CSV (Query based)

```
gcloud sql export csv my-sql \
gs://my-bucket/orders.csv \
--database=salesdb \
--query="SELECT * FROM orders"
```

6️⃣ HIGH AVAILABILITY & REPLICAS

Create Read Replica

```
gcloud sql instances create my-replica \
```

```
--master-instance-name=my-sql \
--region=asia-south1
```

Promote Replica

```
gcloud sql instances promote-replica my-replica
```

Manual Failover (HA)

```
gcloud sql instances failover my-sql
```

7️⃣ NETWORKING & CONNECTIVITY

Enable Public IP

```
gcloud sql instances patch my-sql --assign-ip
```

Enable Private IP

```
gcloud sql instances patch my-sql \
--network=default \
--no-assign-ip
```

Authorize Client Network

```
gcloud sql instances patch my-sql \
--authorized-networks=203.0.113.10/32
```

8️⃣ SSL / TLS COMMANDS

```
gcloud sql ssl client-certs create client-cert my-sql
```

```
gcloud sql ssl client-certs list --instance=my-sql
gcloud sql ssl client-certs delete CERT_NAME --instance=my-sql
```

9️⃣ STORAGE & PERFORMANCE

```
gcloud sql instances patch my-sql --storage-size=200GB
gcloud sql instances patch my-sql --storage-auto-increase
```

🔟 MAINTENANCE WINDOW

```
gcloud sql instances patch my-sql \
--maintenance-window-day=7 \
--maintenance-window-hour=3
```

1️⃣1️⃣ IAM (ACCESS CONTROL)

```
gcloud projects add-iam-policy-binding <PROJECT_ID> \
--member="serviceAccount:app-sa@<PROJECT_ID>.iam.gserviceaccount.com" \
--role="roles/cloudsql.client"
```

1️⃣2️⃣ OPERATIONS & MONITORING

```
gcloud sql operations list --instance=my-sql
gcloud sql operations describe OPERATION_ID
```

EXAM QUICK MEMORY MAP

```
instances → server
databases → schema
users → login
import/export → GCS only
replica → read scaling
failover → HA
ssl → encryption
```

INTERVIEW ONE-LINER

Cloud SQL can be fully managed using gcloud commands for instance lifecycle, security, backups, replication, and data migration.