Sample relations:

i) Student schema (crn, name, address, phone, dob)
ii) Department schema (deptid, dnumber, dname)
iii) Course schema (Courseid, coursename, duration, fee)

Write SQL Statements for the following:

1) Create a relation student on the student schema with the underlined attribute as a primary key. The attribute is not null.

Ans: *create table student (*
Crn varchar(15) primary key,
Name varchar(20) not null,
Address varchar(20) not null,
Phone int not null,
Dob date not null);

2) Insert a tuple into relation student with crn as null. Comment.

Ans: *insert into student values (null, 'Ram', 'ktm', 9876543210, '1990-01-01');*
Error: Column 'crn' cannot be null
Comment: This query violates the entity integrity constraints I.e no primary key can be null.

3) Insert a tuple into student with crn 066/bct/045. Comment.

Ans: *Insert into student values ('066/bct/045', 'Ram', 'ktm', 9876543210, '1990-01-01);*
insert into student (crn) values ('066/bct/045'); => This is a mistake because all the other attribute are not null and they are not assigned and default value.

4) Insert a tuple into student with crn 066/bct/045. Comment.

Ans: *Insert into student values ('066/bct/045', 'Ram', 'ktm', 9876543210, '1990-01-01);*
Error: Duplicate entry '066/bct/045' for key 'student.PRIMARY'
Comment: This violates the domain integrity constraints. Attributes assigned as primary key cannot have duplicate values.

5) Alter the relation student to add parents name and emailid.

Ans: *alter table student add column(*
parent_Name varchar(20) not null,
emailid varchar(30) not null);

6) Create a relation department on the department schema with the underlined attribute as primary key. Add the constraint to the relation department such that dnumber is only between 10 and 50 and also

Ans: create table department (
deptid varchar(15) primary key,
dnumber int, check(dnumber >= 10 and dnumber <= 50),
dname varchar(20), check(dname = upper(dname)));
This works fine in oracle as well as in mysql. But in MySQL, the last check constraint for dname does not work properly. I am not able to figure out the reason.

In MYSQL:

create table department(
deptid varchar(20) primary key,
dnumber int,
dname varchar(20) collate utf8mb4_la_0900_as_cs,
constraint dnumber_chk check(dnumber>=10 and dnumber<=50),
constraint dname_chk check(dname = upper(dname)));

7) Insert a tuple into a relation department with dnumber as 10 and dname as COMPUTER. Comment.

Ans: insert into department values('D01', 10, 'COMPUTER');
Comment: inserted tuples is valid because it matches the established constraints.

8) Insert a tuple into a relation department with dnumber as 20 and dname as Civil. Comment.

Ans: insert into department values ('D02', 20, 'Civil');
Error: Check constraint 'dname_chk' is violated.
Comment: inserted tuple violate dname_chk because it has mixed case word for dname.

9) Create a relation course on course schema with the underlined attribute as primary key. The course name is unique.

Ans: create table course(
Courseid varchar(20) primary key,
coursename varchar(20) unique,
duration float,
fee int);

10) Add a constraint to the relation course such that the minimum fee for all courses is 5000.

Ans: *alter table course add constraint check(fee>=5000);*

11) Fill in the table course with the data of your choices provided that the courses offered are only LINUX, ORACLE, JAVA and CISCO.

Ans: *insert into course values ('C01', 'LINUX', 2.3, 5000);*
insert into course values ('C02', 'ORACLE', 2.5, 8000);
insert into course values ('C03', 'JAVA', 2.5, 5000);
insert into course values ('C04', 'CISCO', 2, 5600);

12) Insert a tuple into the relation course with the course name Visual Basic. Comment.

Ans: *insert into course values ('C05', 'Visual Basic', 2.5, 10000);*

13) Add a constraint to the relation student so that the attributes phone number and dob together form a unique key.

Ans: *alter table student add constraint phone_dob_chk unique(phone, dob);*

14) Insert a tuple into relation student with crn as null. Comment.
Ans: insert into student values (null, ‘sakar’, ‘lalitpur’, 9876543210, ‘2000-01-01’, ‘GOD’, ‘sakar@gmail.com’);
Error: Column ‘crn’ cannot be null
Comment: Since ‘crn’ is specified as primary key. Hence it can not be null, otherwise it violates entity integrity constraint.

15) Insert a tuple into the relation student with the attributes phone number as null value. Comment.
Ans: *insert into student values ('CRN_01', 'sakar', 'lalitpur', null, '2000-01-01', 'GOD', 'sakar@gmail.com');*
Error: Column ‘phone’ cannot be null
Comment:

16) Insert a tuple into the relation student with both the attribute phone number and dob as null value. Comment.
Ans: insert into student values ('CRN_01', 'sakar', 'lalitpur', null, null, 'GOD', 'sakar@gmail.com');

17) Drop the constraint applied to dname of schema department.
Ans: *alter table department drop constraint abcd;*

18) Alter the relation Course to change the data type from integer to floating point.
Ans: *alter table course modify fee float;*

19) Drop the constraint applied on combination of attributes phone number and dob from relation student.
Ans: *alter table student drop constraint phone_dob_chk;*

20) Delete all the records from the relation student.
Ans: *delete from student;*

21) Remove the relation student from the database.
Ans: *drop table student;*

22) Remove the relation course and department from the database.
Ans: *drop table course, department;*