Q3

(1) List the student details who registered in course code = 'SWE1001'.

Ans

$$\Pi_{*}\left(\sigma_{r.code = 'SWE1001'}\left(\rho_{s}(student) \bowtie \rho_{r}(Registered)\right)\right)$$

(2) List the number of students in each course

Ans

$$code\ \mathcal{G}_{count(regno)}(Registered)$$

OR.

$$\gamma_{code,\ count(regno)}(Registered)$$

(3) List the department no which are having less than 2 students.

$$\gamma_{dno,\ count(regno)<2}(Registered)$$

OR

$$dno\ \mathcal{G}_{count(regno)<2}(Registered)$$

(4) List the student name, department name, HOD, and course registered by student having more than 9.0 CGPA

$$\Pi_{s.sname,\ d.dname,\ d.HOD,\ r.code}\Big(\sigma_{s.cgpa>9.0}\left(\rho_{d}(department) \bowtie \rho_{s}(student) \bowtie \rho_{r}(registered)\right)\Big)$$

15) Retrieve the average CGPA of each department

Ans

$$\gamma_{dno,\ avg(CGPA)}(Student)$$

OR

$$dno\ (\gamma_{avg(CGPA)}(Student))$$

16) Retrieve the student register number who are not registered for any course

Ans

$$[\pi_{Regno}(Student)] - [\pi_{Regno}(Registered)]$$

Q4

(1) List the employee id who is working on more than 3 projects

Ans

$$\gamma_{empid,\ count(Pno)>=3}(Works\_on)$$

OR.

$$empid\ \mathcal{G}_{count(Pno)>=3}(works\_on)$$

(2) Retrieve the number of projects in each department

Ans

$$\gamma_{dno,\ count(Pno)}(Project)$$

OR

$$dno\ \mathcal{G}_{count(Pno)}(Project)$$

(3) Retrieve the employee id, name, salary, d_name, manager_id and project name working on.

Ans

$$\Pi_{e.id,\ e.name,\ e.salary,\ d.dname,\ d.mgr\_id,\ p.pname}\Big(\rho_e(employee) \underset{e.id=w.empid}{\bowtie} \rho_w(works\_on) \underset{w.pno=p.pno}{\bowtie} \rho_p(Project) \bowtie_{pdno=d.dno} (department)\Big).$$

4 Retrieve the employee details who are working on Department 'Marketing' and getting Salary more than 50000.

Ans

$$\Pi_{*}\left(\sigma_{d.dname='Marketing' \wedge s.Salary>=50000}\left(\rho_{d}(department) \bowtie \rho_{s}(salary)\right)\right)$$

5 Retrieve the department numbers which does not have any project.

Ans

$$\left[\Pi_{dno}(Department)\right] - \left[\Pi_{dno}(Project)\right]$$

(6) Retrive all the department numbers, department name and controlling project numbers, project name if any.

Ans

$$\Pi_{d.dno,\ d.dname,\ P.Pno,\ P.Pname}\left(\rho_{p}(Project) \bowtie \rho_{d}(Department)\right)$$