1.

{(snum, sname) | (∃year, STUDENT(snum, sname, year) $\wedge$ year = 2) $\wedge$
  (∃deptcode, deptname, DEPARTMENT(deptcode, deptname) $\wedge$ deptname = "computer science") $\wedge$
  (∃cnum1, term1, sec1, grade1, MARK(snum, deptcode, cnum1, term1, sec1, grade1) $\wedge$ grade1 < 65) $\wedge$
  (∃cnum2, term2, sec2, grade2, MARK(snum, deptcode, cnum2, term2, sec2, grade2) $\wedge$ grade2 < 65) $\wedge$
  (¬cnum1 = cnum2)}

2.

{(pnum, pname) | (∃office, pdeptcode, PROFESSOR(pnum, pname, office, pdeptcode) $\wedge$ pdeptcode = "CS")
  $\wedge$ (∃cnum1 , cnum2, deptcode, deptcode = "CS" $\wedge$ cnum1 = 240 $\wedge$ cnum2 = 245)
  $\wedge$ ¬(∃term1, sec1, CLASS(deptcode, cnum1, term1, sec1, pnum))
  $\wedge$ ¬(∃term2, sec2, CLASS(deptcode, cnum2, term2, sec2, pnum))}

3

{(pnum, pname) | (∃deptcode, cnum, deptcode= "CS" $\wedge$ cnum = 245) $\wedge$ (∃office, pdeptcode, PROFESSOR(pnum, pname, office, pdeptcode)
  $\wedge$ ((∃term1, sec1, CLASS(deptcode, cnum, term1, sec1, pnum)) $\wedge$ (∃snum1, grade1, MARK(snum1, deptcode, cnum, term1, sec1, grade1))
  $\wedge$ ¬ (∃term2, sec2, snum2, grade2, MARK(snum2, deptcode, cnum, term2, sec2, grade2) $\wedge$ grade2 > grade1)}

4.

{(snum, sname) | (∃year, STUDENT(snum, sname, year) $\wedge$ year = 4) $\wedge$
  ¬(∃deptcode, cnum, term, sec, grade, MARK(snum, deptcode, cnum, term, sec, grade) $\wedge$ grade < 85) $\wedge$ (deptcode = "CO" $\vee$ deptcode = "CS")}

5.

{(pnum, pname, office, pdeptcode) | PROFESSOR(pnum, pname, office, pdeptcode)
  $\wedge$ ((∃cnum1, term, sec1, deptcode1 CLASS(deptcode1, cnum1, term, sec1, pnum)
  $\wedge$ ¬(∃snum1, grade1, MARK(snum1, deptcode1, cnum1, term, sec1, grade1))
  $\wedge$ (∃day1, time1, room1, SCHEDULE(deptcode1, cnum1, term, sec1, day1, time1, room1) $\wedge$ day1 = "Monday" $\wedge$ time1 < 12:00:00.00))
  $\wedge$ ((∃cnum2, sec2, deptcode2, CLASS(deptcode2, cnum2, term, sec2, pnum)
  $\wedge$ ¬(∃snum2, grade2, MARK(snum2, deptcode2, cnum2, term, sec2, grade2))
  $\wedge$ (∃day2, time2, room2, SCHEDULE(deptcode2, cnum2, term, sec2, day2, time2, room2) $\wedge$ day2 = "Friday" $\wedge$ t ime2 > 12:00:00.00))}

6.

{(deptcode, cnum, term, sec, ming, maxg, pnum, pname, pdeptname) |
  $\wedge$ ∃pdeptcode, DEPARTMENT(pdeptcode, pdeptname)
  $\wedge$ ∃office, PROFESSOR(pnum, pname, office, pdeptcode)
  $\wedge$ CLASS(deptcode, cnum, term, sec, pnum) $\wedge$ cnum $\geqslant$ 300 $\wedge$ cnum $<$
400 $\wedge$ deptcode = "CS"
  $\wedge$ ∃snum1, MARK(snum1, deptcode, cnum, term, sec, ming)
  $\wedge$ ∃snum2, MARK(snum2, deptcode, cnum, term, sec, maxg)
  $\wedge$ ¬(∃snum3, grade, MARK(snum3, deptcode, cnum, term, sec, grade) $\wedge$
(grade $<$ ming $\vee$ grade $>$ maxg))
  }

7.
{(deptcode, cnum) | ∃term, sec, ¬(∃pnum, pname, office, pdeptcode,
PROFESSOR(pnum, pname, office, pdeptcode) $\wedge$ (pdeptcode = "CS" $\vee$
pdeptcode = "CO") $\wedge$ CLASS(deptcode, cnum, term, sec, pnum)
  $\wedge$ ¬ (∃snum, grade, MARK(snum, deptcode, cnum, term, sec, grade)))}

8.
{(pnum, pname, pdeptname) | ∃deptcode, DEPARTMENT(pdeptcode,
  pdeptname) $\wedge$ ∃office, PROFESSOR(pnum, pname, office, pdeptcode)
  $\wedge$ (∃cnum1, term, sec1, deptcode1, CLASS(deptcode1, cnum1, term, sec1,
  pnum)
  $\wedge$ ∃day1, time1, room1, SCHEDULE(deptcode1, cnum1, term, sec1, day1,
  time1, room1)
  $\wedge$ day1 = "Monday")
  $\wedge$ (∃cnum2, sec2, deptcode2, CLASS(deptcode2, cnum2, term, sec2, pnum)
  $\wedge$ ∃day2, time2, room2, SCHEDULE(deptcode2, cnum2, term, sec2, day2,
  time2, room2)
  $\wedge$ day2 = "Friday")}

9.
{(snum, sname) | ∃year, STUDENT(snum, sname, year) $\wedge$ year = 4
  $\wedge$ ∃deptcode1, cnum1, term, sec1, grade1, MARK(snum, deptcode1, cnum1,
  term, sec1, grade1) $\wedge$ deptcode1 = "CS" $\wedge$ cnum1 = 348
  $\wedge$ ¬(∃deptcode2, cnum2, sec2, grade2, MARK(snum, deptcode2, cnum2, term,
  sec2, grade2) $\wedge$ grade1 $<$ grade2)}

10.
{(pnum, pname) | ∃deptcode, cnum, deptcode = "CS" $\wedge$ cnum = 348
  $\wedge$ ∃office, pdeptcode, PROFESSOR(pnum, pname, office, pdeptcode)
  $\wedge$ ∃term1, term2, term3, sec1, sec2, sec3, CLASS(deptcode, cnum, term1,

sec1,pnum) $\wedge$ CLASS(deptcode, cnum, term2, sec2,pnum) $\wedge$ CLASS(deptcode, cnum, term3, sec3,pnum) $\wedge$ ($\neg$term1 = term2 $\vee$ $\neg$sec1 = sec2) $\wedge$ ($\neg$term1 = term3 $\vee$ $\neg$sec1 = sec3) $\wedge$ ($\neg$term2 = term3 $\vee$ $\neg$sec2 = sec3)

$\wedge$ $\neg$ ($\exists$snum, grade, (MARK(snum, deptcode, cnum, term1, sec1, grade) $\vee$ MARK(snum, deptcode, cnum, term2, sec2, grade) $\vee$ MARK(snum, deptcode, cnum, term3, sec3, grade)) $\wedge$ grade <75)}