Task1. Will the conversion to BCNF be dependency preserving in any case? Proof your statement and give a reasoning for choosing BCNF design.

BCNF is not be dependency preserving. For example, if we consider a schema:
dept_advisor(student_ID, instructor_ID, dept_name) with dependencies:
instructor_ID -> dept_name
student_ID, dept_name -> instructor_ID.
dept_advisor is not in BCNF: instructor_ID is not a superkey. Any decomposition of dept_advisor will not include all the attributes in student_ID, dept_name -> instructor_ID.
Thus, the composition is NOT be dependency preserving

Task2.

StudentID	UnitID	Date	Room	Grade
St1	U1	23.02.03	629	4.7
St2	U2	18.11.02	631	5.1
St4	U1	23.02.03	629	4.3
St2	U5	05.05.03	632	4.9
St2	U4	04.07.03	621	5.0

UnitID	Topic	Book
U1	GMT	Deumlich
U2	Gln	Zehnder
U5	PhF	Dummlers
U4	AVG	SwissTopo

TutorID	TutEmail
Tut1	tut1@fhbb.ch
Tut3	tut3@fhbb.ch
Tut5	tut5@fhbb.ch

UnitID	StudentID	TutorID
U1	St1	Tut1
U2	St1	Tut3
U1	St4	Tut1
U5	St2	Tut3
U4	St2	Tut5

Task3.

ProjectName	ManagerID
Project1	1
Project2	2

ProjectName	Budget	TeamSize
Project1	1kk $	15
Project3	1,5kk $	12

ManagerID	ProjectManager	Position
1	Manager1	CTO
2	Manager2	CTO2

Task4.

Group	Speciality
G1	S1
G2	S2

Speciality	Faculty
S1	F1
S2	F2

Task5.

ID	ProjectID	Department	Curator	TeamID
Id1	P1	D1	E1	T1
Id2	P2	D2	E2	T2

TeamID	ProjectGroupNumber
T1	5
T2	6

ID	TeamID	Teamsize
Id1	T1	100
Id2	T2	120

Task6.

Goal for a relational database design is:

- BCNF
- Lossless join
- Dependency preservation

If we cannot achieve this, we accept one of

- Lack of dependency preservation
- Redundancy due to use of 3NF