

In-Semester Test-2 IT 214 Database Management Systems

Time: 90 minutes

Max Points: 80

IMPORTANT NOTE:

- 1. Write answers neat and clean. Answers that are difficult to read may simply be discarded.
- 2. Answer all queries in order. If you want to defer answering a query, may move to next by leaving sufficient blank space. You may follow a strategy of not answering more than two queries on a page.
- Each query is for 10 points, and awarding strategy will be discrete (i.e., 0, 5, and 10).
- 4. You may have to pay penalty for lengthier query expressions.
- All queries are to be answered in Relational Algebra. No marks will be awarded if answered in SQL.
- 1. Given below is relational schema extended version of schema DA-Acad (discussed in lectures and used in labs). While extending it, names and meaning of original relations and attributes is retained.

_Student(StudetID, StdName, ProgID, Batch, CPI)

Course(CourseNo, CourseName, Credit)

Faculty(FacultyID, FacultyName) -

Offers(AcadYear, Semester, CourseNo, FacultyID, Grade_Submitted_Flag)

//Attribute "Grade_Submitted_Flag" is used to store grade submission status of a course offer

//FK: CourseNo refers to Course(CourseNo)

//FK: FacultyID refers to Faculty(FacultyID)

-Registers(StudetID, AcadYear, Semester, CourseNo, grade) -

//for better machine interpretability, let us store grades in numeric form, i.e. 10, 8, and so.

//FK: StudetID refers to Student (StudetID)

//FK: (AcadYear, Semester, CourseNo) refers to Offers

SemesterResult(StudetID, AcadYear, Semester, SPI, CPI)

//FK: StudetID refers to Student (StudetID)

HoR_Wing(wing, gender)

//wing attribute identifies a HoR wing, and draws value from alphabets A to J.

//wings are reserved for a specific gender 'M' or 'F', however assume that

a wing can be assigned to other gender anytime.

HoR_Room(rno, wing, floor)

//FK: wing refers to HoR_Wing

//floor is labeled as 1 for ground, 2 for first, and 3 for second floor.

//to be informative to human users, attribute rno draws value from pattern

// "<wing><floor><number>", for example rno C110, indicates that it is in

// C wing, ground floor, and number is 10.

Allot(sid, rno)

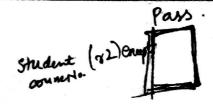
//FK: sid refers to student

//All room allotments are recorded in this relation.

the relation also has NOT NULL constraint for attribute rno.

A students whose sid does not appear in this relation indicates that

student dous not restle en



Using given relational schema, write relational algebra expressions for following querics-

- Report (CourseNo, FacultyName) who have not submitted grades for semester 'Autumn', 2016.
- 2. Report (StudentID) who have got more than two F (i.e. zero) grade in 'Winter', 2016.
- 3. Report (Faculty-Name) who have taught more than three courses in academic year, 2015-16.
- 4. Report (StudentID, Student-Name, Grade) of students who are residing in C second floor and took course IT633 in 'Autumn', 2015.
- 5. Report (StudentID, Student-Name) of M Tech 2015 (progid=11) residing in HoR (Man).
- 6. Report (StudentID, CourseNo) backlogs* for B Tech ICT (progod = '01') batch 2012.
 - *Let us define backlog as a set of courses that a student has taken ever MINUS set of courses student has got pass grade (i.e. not zero). Also account for that a student takes a course, let us say IT123, got zero grade in first attempt, and got pass grade in second (or even third) attempt.
- 7. Report (StudentID, Student-Name, CPI) that have scored more 7.0 grade in all of the courses given here {IT110, IT214, IT205, SC215, IT314, IT301}.
- 8. Report (CourseNo, FacultyName) for courses offered since 'Autumn', 2010 in which more than 50% students got grade got more than 7.0.

