National University of Computer and Emerging Sciences, Lahore
Mid-1, Fall 2012

Course: CS204- DATABASE SYSTEMS Max Points: 30 Time Allowed: 90 min.

Section: _____ Name: _____ Roll No: _____

Consider the following Movie database for all the questions; for simplicity assume that the title of a movie is unique. The length of the movie is its running time in minutes, and networth of the studio is its monetary value in dollars. Foreign keys are studioName, actorSSN, and movieTitle.

Movie

Title	Year	Length	StudioName	ProductionCost
Star Wars	2005	130	Fox	750000
Addams Family	1982	108	Paramount	155000
Wayne's World	1992	95	Paramount	72000
Mighty Ducks	2012	NULL	Disney	NULL

StarsIn

ActorSSN	MovieTitle
1	Star Wars
1	Wayne's World
2	Addams Family
2	Wayne's World
3	Star Wars
3	Addams Family
3	Wayne's World
4	Addams Family

Actor

SSN	Name	Gender	Address
1	Carrier Fisher	F	123 Maple, Hollywood
2	Mark Hamil	M	456 Oak Rd., Brentwood
3	Harrison Ford	M	789 Palm, Beverly Hills
4	Julia Ann	F	45 Maple, Hollywood
5	Robert Hook	M	92 Palm, Beverly Hills

Studio

Name	Address	Networth
Fox	Hollywood	9000000
Warner Brothers	Hollywood	500000
Disney	Buena Vista	7500000
Paramount	Hollywood	9200000

Question 1 *(10 points)*
Consider the above database schema; Write the following queries in SQL:

a) List the number of movies produced by each studio, consider only the studio that have networth at least 1million US dollars and produced at least 10 movies.

b) Find the male actors who work on all the movies produced by 'Disney' studio in year 2000.

Question 2 *(10 points)*
Given the above relational state, write the result of the following relational algebra expressions. Also show the result of intermediate relations:

a) $M1 \leftarrow \pi_{MovieTitle}$ (StarsIn)

$S1 \leftarrow \pi_{StudioName}$ (M1 $\bowtie_{MovieTitle=title}$ Movie)

$RESULT \leftarrow S1 - \pi_{Name}$ (Studio)

b) $RESULT \leftarrow \pi_{Name, Title}$ (Movie $\setminus_{Title=MovieTitle}$ ($\sigma_{Gender=M}$ (Actor $\setminus_{ssn=actorSsn}$ StarsIn))

Question 3 *(10 points)*
Suppose each of the following update operations are applied directly to the database state shown above and all these operations are independent from each other. Assume for all foreign key columns, applicable referential action for ON DELETE and ON UPDATE is CASCADE. Tell if the operation would be done successfully (i.e. acceptable) or not. Explain your answer briefly. Also state all the integrity constraints violated by each operation, if any.

a) INSERT INTO movie VALUES ('Harry Potter', 2001, 90, NULL, 115500000).

Accept O **Explain:**
Reject O

b) UPDATE starsIn SET actorSSN=5 WHERE movieTitle='Addams Family'.

Accept O **Explain:**
Reject O

c) UPDATE movie SET studioName='Van Beuren' WHERE Title='Mighty Ducks'.

Accept O **Explain:**
Reject O

d) DELETE FROM studio WHERE name='Paramount'.

Accept O **Explain:**
Reject O

e) DELETE FROM starsIn WHERE movieTitle='Star Wars'.
Accept O **Explain:**
Reject O