THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

School of Information Technology and Electrical Engineering

INFS1200/7900 MOCK QUIZ 1 Examination

Name: _____

Student Number: _____

Signature: _____

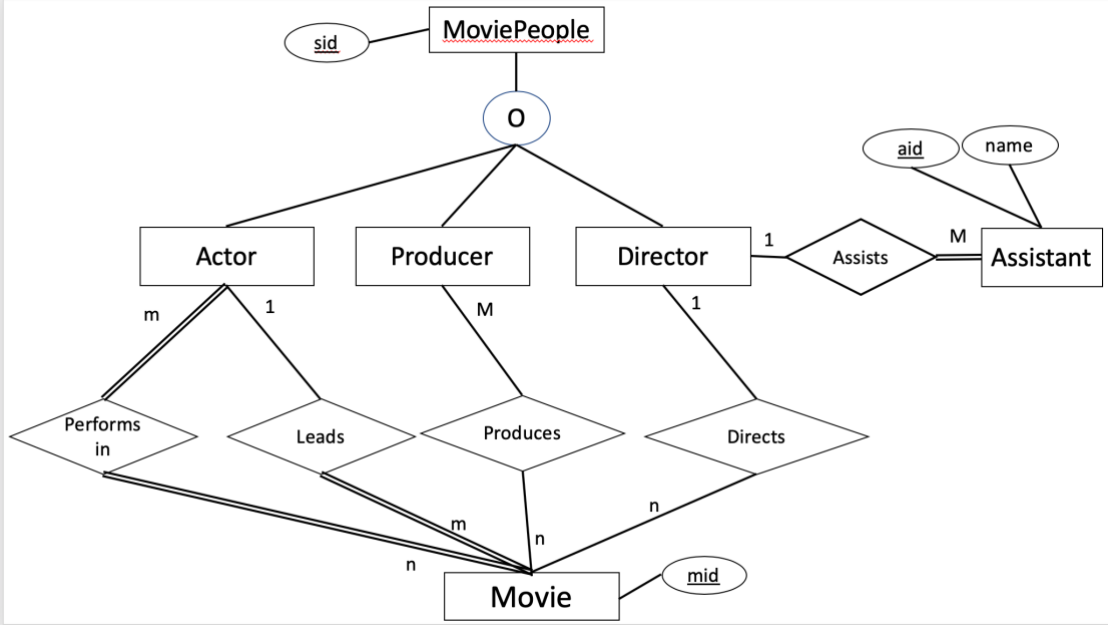
Examiner's Use Only

	Mark	Out of
Q1		10
Q2		10
Q3		10
Q4		10
Q5		6
Q6		4
TOTAL		50

Notes about this examination

1. You have **10 minutes** reading time and **90 minutes** to write this examination.
2. Write your name and student #.
3. You may use a pencil to write your solutions.
4. Answer all the questions on this paper.
5. The marks for each question are given in []. 50 marks in this quiz equals 15 marks in the total assessment of this course.
6. Good luck!

Question 1. [10 marks] Assume that Movies is a populated database, which is designed using the ER diagram below. Respond to the following statements with True, False or Maybe. Assign a response of maybe to statements that, while not explicitly shown to be True, cannot be proven False based on the given model. For each response, briefly justify your answer.



Claims	True/False/Maybe
1. There are no actors in this database that have not been in a movie.	True All actors must participate in the "performs in" relationship.
2. There are some actors who have acted in more than ten movies.	Maybe Actors may participate in many movies. We do not know if this has occurred.
3. Some actors have done a lead role in multiple movies.	Maybe Actors may be the lead in many movies. We do not know if this has occurred.
4. A movie can have multiple lead roles.	False A movie may have only one lead role.
5. Every director has been an actor in some movie	Maybe Directors may also be actors. We do not know if this has occurred.

6. No movie has a director who also acted in that movie	Maybe Directors may also be actors in the same movie. We do not know if this has occurred.
7. Two directors can share the same assistant	False Each assistant 'assists' only one director.
8. Some movie people have been involved with 0 movies.	Maybe Only actors must participate in movies – producers, directors and movie people have no restrictions. We do not know if this has occurred.
9. No two assistants share the same name.	Maybe Name is not part of the primary key so assistants may share the same name. We do not know if this has occurred.
10. A movie can have multiple Producers and multiple Directors.	False A movie may not have more than one director.

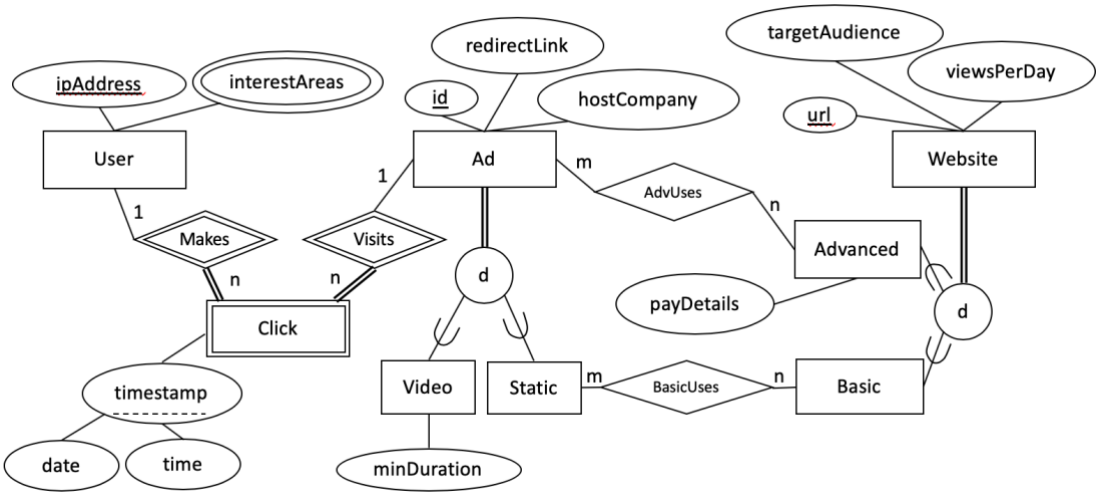
Question 2. [10 Marks] Construct an ER diagram for the following Universe of Discourse.

ElgoogAds is a company providing websites with advertising content to assist with monetization.

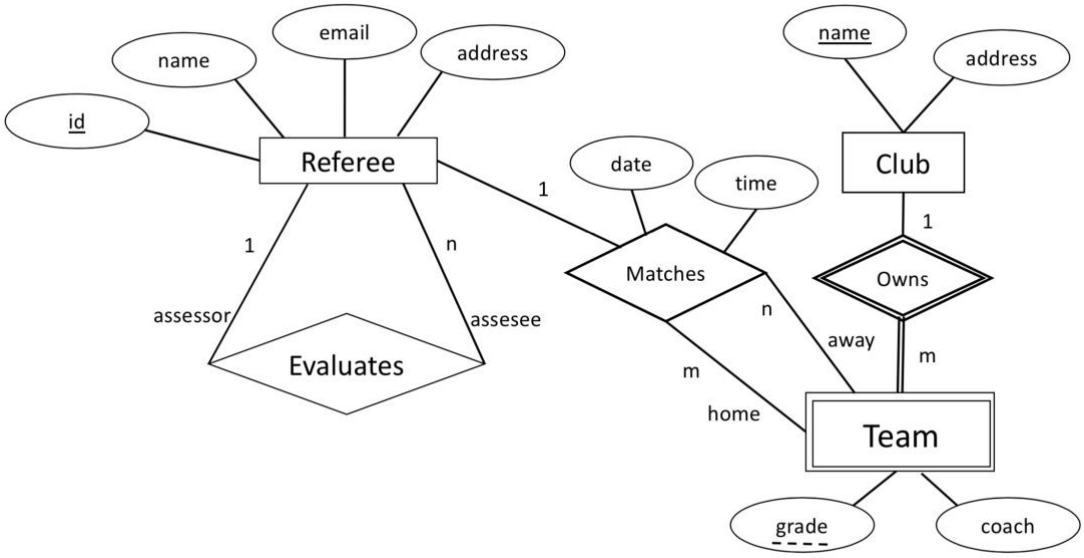
Each Ad has a unique ID, as well as a redirection link and the advertising company's name. Ads can be static or video advertisements. Video ads also store the minimum duration before they can be skipped.

ElgoogAds also tracks the details of the websites hosting their ads. Each of these websites has a unique URL, target audience and average views per day. These websites can sign up to a basic or advanced plan. Advanced websites have their payment details recorded. The basic plan entitles the page to use static ads, which generate less revenue, while the advanced plan allows the website to use both video and static ads.

Internet users who interact with ads are tracked via their unique IP address. The interest areas of each user are also stored based on their browsing patterns. ElgoogAds logs each time a user clicks on an ad and stores the date and time that it occurred. Each user can click on the same ad multiple times.



Question 3. [10 marks] Transform the ER diagram into a relational schema using the methods discussed in class. Remember to include your foreign keys.



Referee [id, name, email, address, assessorID]
Club [name, address]
Team [clubName, grade, coach]
Match [homeClubName, homeGrade, awayClubName, awayGrade, refereeID, date, time]

Referee.assessorID references Referee.id
Team.clubName references Club.name
Match.(homeClubName, homeGrade) References Team.(clubName, grade)
Match.(awayClubName, awayGrade) references Team.(clubName, grade)
Match.refereeID references Referee.id

Question 4. [10 marks] An online music streaming service, Dotify, is set to take over the music world. Dotify allows users to register with their Facebook accounts and can be used free (with loud ads every 3 minutes) or as a premium user. Users can create and share playlists of their favorite music. Dotify also tries to recommend music that it thinks the user would enjoy. Dotify has enlisted you to ensure that its database is in good order, so they can keep advertising their $0.99 trial!

The schema and some example instances are given below:

User [userName, fullName, accountStatus]
Song [songID, songName, artist]
UserPlaylist [userName, playlistName]
PlaylistSong [userName, playlistName, songNum, songID]

UserPlaylist.userName references User.userName
PlaylistSong.songID references Song.songID
PlaylistSong.(userName, playlistName) references UserPlaylist. (userName, playlistName)

User

userName	**fullName**	**accountStatus**
xXxMusicLoverxXx	Katy Perry	Premium
TinySinger123	Ariana Grande	Premium
ImTheVoice	John Farnham	Free

Song

songID	**songName**	**artist**
14234	Friday	Rebecca Black
178237	Mans not hot	Big Shaq
12986	All Star	Smash Mouth

UserPlaylist

playlistName	**userName**
BESTSONGS	TinySinger123
SchoolSongs	TinySinger123
…but it's All Star	ImTheVoice

PlaylistSong

playlistName	**userName**	**songNum**	**songID**
BESTSONGS	TinySinger123	1	14234
SchoolSongs	TinySinger123	1	178237
All star but its…	ImTheVoice	1	12986
All star but its…	ImTheVoice	2	12986
All star but its…	ImTheVoice	3	12986

Work out the questions below on the population given above.

a) Are there any illegal tuples in the PlaylistSong table? If not, give an example of an illegal insertion into PlaylistSong.

PlaylistName is a foreign key but the value "All star but its" cannot be found in the UserPlaylist table. Hence all tuples containing this value are in violation of referential integrity constraint and therefore illegal.

b) Give an example of a tuple delete that would result in referential integrity constraint violation.

Deletion of the tuple with songID 14234 from Song table would result in a referential integrity violation as this tuple is referenced in the table PlaylistSong

c) Give an example of

a super key: Song.(songID, songName)

a minimal key: Song.songID

a foreign key: PlaylistSong.songID

d) Update the tuple <SchoolSongs, TinySinger123> to <QuickMaths, ImTheVoice> in relation UserPlaylist.

Does this operation violate an integrity constraint? Write either "yes" or "no": Yes

If yes, state the type of constraint violated: referential integrity

and briefly describe how the constraint was violated: PlaylistSong is referencing the tuple with <SchoolSongs, TinySinger123>

e) Insert the tuple <MyFavouriteDay, Friday> in relation "UserPlaylist".

Does this operation violate an integrity constraint? Write either "yes" or "no": Yes

If yes, state the type of constraint violated: referential integrity

and briefly describe how the constraint was violated: No user with the name "Friday" exists

f) Insert the tuple <ImAnonymous, NULL, Free> in relation "User".

Does this operation violate an integrity constraint? Write either "yes" or "no":No

If yes, state the type of constraint violated: _____

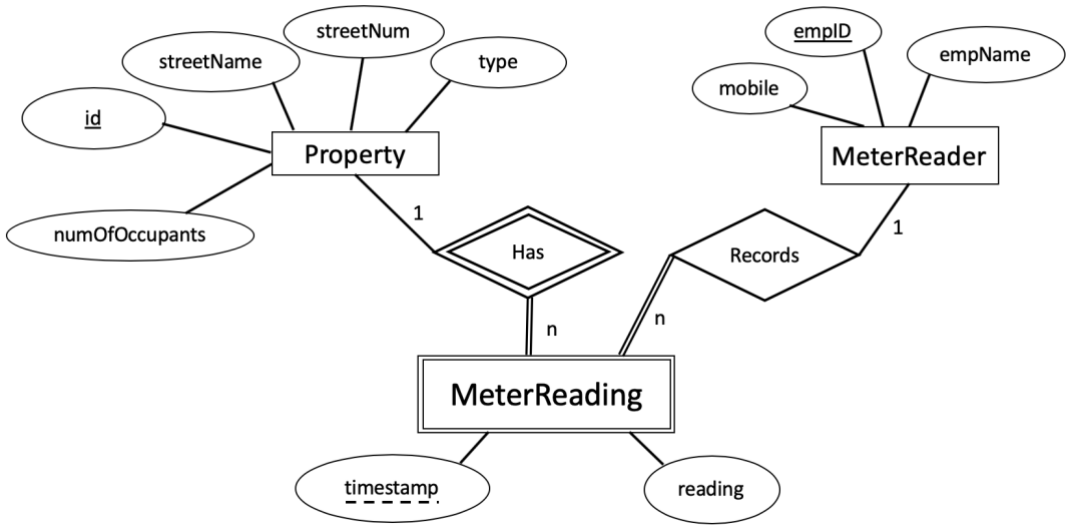
and briefly describe how the constraint was violated: _____

Note: a domain constraint violation could be claimed if a non-null on User.fullName is assumed

Question 5. [6 marks] Reverse Engineer the following Schema to make an ER diagram.

Property [propertyID, streetNum, streetName, propertyType, numOfOccupants]
MeterReader [empID, eName, mobile]
MeterReading [propertyID, timestamp, reading, empID]

MeterReading.propertyID references Property.propertyID
MeterReading.empID references meterReader.empID



Question 6. [4 Marks] Identify and explain two functions of a DBMS.

Any two of

- Controlling redundancy
- Restricting unauthorized access
- Providing multi-user interfaces
- Representing complex relationships
- Enforcing integrity constraints
- Providing backup and recovery

END OF EXAMINATION