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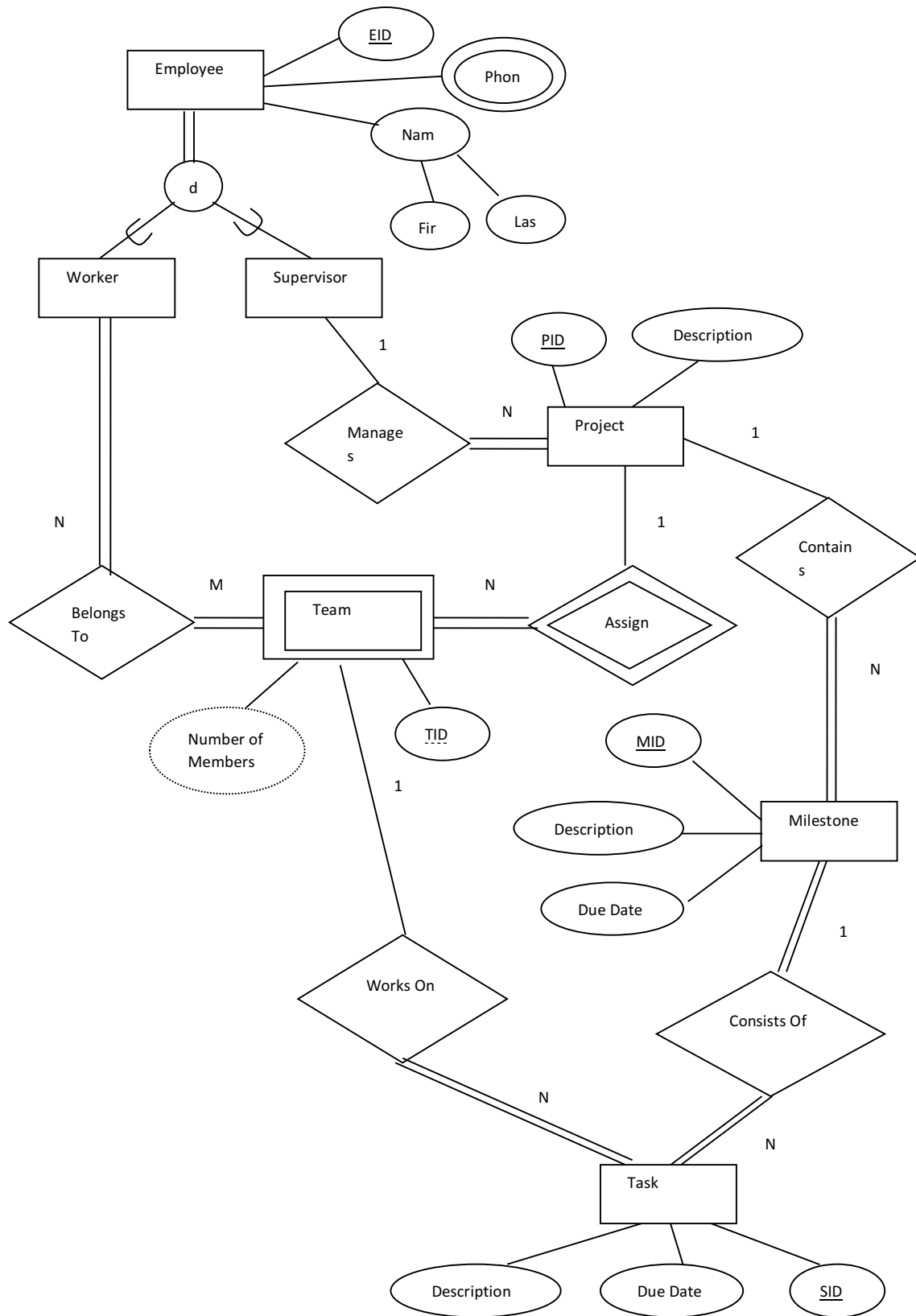
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CS 4400 - Spring 2016 Exam 1

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Figure 1. Project Management EER Diagram (For Questions 15-25)



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1. Which of the following statements is true?
 - a) A database is a logically coherent collection of data with some inherent meaning.
 - b) Current database systems can only store numeric or textual data.
 - c) An application program accesses the database by sending queries/updates to the database management system.
 - d) Both (a) and (c)

2. The definition or description of the database structure and constraints is referred to by which of the following?
 - a) requirements specification
 - b) transaction
 - c) meta-data
 - d) universe of discourse

3. Why is the concept of a view important in database systems?
 - a) It allows users to perceive the data differently from how it is explicitly stored in the database.
 - b) It allows the database system to hide data from certain users.
 - c) It allows the database to be accessed by multiple concurrent users.
 - d) Both (a) and (b)

4. Which of the following are important capabilities that a good database management system should provide?
 - a) security of data and authorization of users
 - b) persistent storage of data
 - c) efficient query execution
 - d) All of the above

5. Which of the following is an example of a data integrity constraint for a Company database system?
- a) Only users from the Human Resources department can access the salary of an employee.
 - b) The employee number associated with each employee should be unique.
 - c) Only one user can update the budget of a given department at any one time.
 - d) All of the above
6. In database systems, _____ generally refers to the suppression of details of data organization and storage. **Choose the appropriate phrase to fill in the blank.**
- a) data dynamics
 - b) data abstraction
 - c) an access path
 - d) a database state
7. A conceptual data model provides _____. **Choose the appropriate phrase to fill in the blank.**
- a) concepts that describe the details of how data is stored on the computer storage media
 - b) concepts that describe the details of how the data is represented for querying and updating
 - c) concepts that are close to the way many users perceive data at a high level of abstraction
 - d) None of the above
8. Is the concept of abstraction important in the three schema database architecture?
- a) Yes
 - b) No
9. What is the concept of mapping in the three schema database architecture?
- a) It is the process of defining the valid database states.
 - b) It is the action of loading the data into the database.
 - c) It is the action of computing in the cloud.
 - d) It is the process of transforming requests and results between the adjacent schema levels.
10. Which of the following is a definition of data independence in a three schema architecture?
- a) The capacity to change the schema at one level of a database system without having to change the schema at the next higher level

- b) The process of changing the mapping between any two schema levels.
- c) The process of changing the external schema level without affecting the internal schema level.
- d) None of the above

11. The SQL database language represents which combination of database languages?

- a) data definition, view definition and data manipulation languages
- b) data definition and view definition languages
- c) view definition and data manipulation languages
- d) data definition and data manipulation languages

12. Which of the following statements defines the external schema in a three schema architecture?

- a) It describes the views of different user groups.
- b) It describes the physical storage structure of the database.
- c) It provides a high-level description of the entire database.
- d) It describes the way the database is distributed over multiple sites in a distributed computer network.

13. Which of the following statements is true with respect to the Entity Relationship model?

- a) An entity type defines a collection of entities that have the same attributes.
- b) An attribute which is a key for an entity type is an attribute whose values are distinct for each instance of that entity type.
- c) A relationship type connecting n entity types defines a set of associations among instances of those n entity types.
- d) All of the above

14. A weak entity type in the ER model always has _____ with respect to its identifying relationship. **Choose the appropriate phrase to fill in the blank.**

- a) a partial participation constraint
- b) a many to many relationship cardinality
- c) a total participation constraint
- d) a one to one relationship cardinality

Refer to the EER diagram in Figure 1 for questions 15 through 25.

15. How many entity types have a key which consists of more than 1 attribute?
- a) 0
 - b) 1**
 - c) 2
 - d) 3
16. Can an instance of the Worker entity type have the same value for EID as an instance of the Supervisor entity type?
- a) Yes
 - b) No**
17. Which of the following is a derived attribute?
- a) Phone
 - b) Name
 - c) Number of Members**
 - d) TID
18. Which of the following conditions are necessary for the Due Date attribute of 1 instance of the entity type Task to have the same value as the Due Date attribute for 1 instance of the Milestone entity type?
- a) the Milestone instance must have multiple instances of related Tasks via the Consists Of relationship type
 - b) the instance of Task must not be related to the instance of Milestone through the Consists Of relationship type
 - c) the instance of Task must be related to the instance of Milestone through the Consists Of relationship type
 - d) None of the above**
19. If there are 10 instance of Worker and 5 instances of Team, then which of the following statements **must** be true?
- a) Every Worker Belongs To 2 Teams
 - b) Every Team has only 1 Worker
 - c) One Worker cannot Belong To 5 Teams
 - d) None of the above**

20. Which of the following statements **must** be true?
- a) An instance of Team must be Assigned to a Project
 - b) An instance of Team does not need related Workers
 - c) If a Task instance is Worked On by a Team, then that Task instance must be related through Consists Of, Milestone and Contains to the Project instance that the Team is Assigned
 - d) Both (a) and (c)
21. If there are 20 instances of Employee and 15 instances of Worker and 4 instances of Project, then how many Supervisors are Managing those Projects?
- a) Exactly 4 Supervisors
 - b) Exactly 5 Supervisors
 - c) The number of Supervisors can range from 1 to 4
 - d) The number of Supervisors can range from 0 to 5
22. Which set of attributes identify an instance of the Belongs To relationship?
- a) EID
 - b) TID
 - c) EID, TID
 - d) EID, TID, PID
23. If there are 12 instances of the Team entity type, then what is the minimum number of instances of the Worker entity type that must exist?
- a) 0
 - b) 1
 - c) 12
 - d) 13
24. If there are 12 instances of the Team entity type, then what is the minimum number of instances of the Project entity type that must exist?
- a) 0
 - b) 1
 - c) 11
 - d) 12
25. Does an instance of the Task entity type imply the existence of a Project entity type?
- a) Yes
 - b) No