ICST211 Database Management Systems 1  
Ateneo de Naga University 
Midterm Examination 
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Instructions: 
   a) Write your answers on the answer sheets provided. 
   b) Use only BLACK or BLUE pen. 
   c) Avoid Erasures. Erasures will invalidate your answer. 

GOOD LUCK!!! 

I. Multiple Choice. Write the letter that corresponds to the best answer. 

1. A customer may request a model of a car from a rental branch on a particular date. The underlined words are called: 
   a. terms  
   b. facts  
   c. attributes  
   d. relationships 

2. In the following diagram shown, CERTIFICATE is an example of: 

[Diagram: EMPLOYEE - CERTIFICATE - COURSE] 
   a. Associative entity  
   b. Relationship  
   c. Attribute  
   d. Relational entity 

3. A ____ specifies the number of instances of one entity that can be associated with each instance of another entity 
   a. degree  
   b. cardinality constraint 
   c. relationship  
   d. none of the given 

4. A meaningful relationship between entity types is called a(n) ____. 
   a. relationship type  
   b. relationship instance  
   c. entity type 
   d. entity instance 

5. Older systems that contain data of poor quality are often called ____ systems. 
   a. controlled  
   b. legacy  
   c. database  
   d. mainframe 

6. Which of the following is a characteristic of an enterprise data model? 
   a. It stresses the integration of data.  
   b. It duplicates data. 
   c. It creates physical relationships.
d. It reduces storage

7. Each column in a table represents an ___ of an entity.
   a. description
   b. attribute
   c. byte
   d. logical element

8. Which of the following functions does a database application program perform?
   a. Create data
   b. Retrieve data
   c. Delete data
   d. All of the above

9. A workgroup database is stored on a central device called an:
   a. client
   b. server
   c. network
   d. none of the above

10. Which of the following are strategic planning factors?
    a. Organizational goals
    b. Problem areas
    c. Critical success factors
    d. All of the above

11. Organizing the database in computer disk storage is done in the ____ phase.
    a. logical design
    b. physical design
    c. analysis
    d. implementation

12. The definition of the database that provides all the specifications to the database technology is contained in a(n):
    a. conceptual schema
    b. data definition specification
    c. physical schema
    d. database technical system

13. The detailed, technology independent specification of the overall structure of the database is called the:
    a. physical schema
    b. user view
    c. external schema
    d. conceptual schema

14. A ____ allows a question to be answered as posed to the database.
    a. client
    b. query
    c. report
    d. form

15. The number of entity types that participate in a relationship is called the:
    a. number
    b. identifying characteristics
    c. degree
16. A value that indicates the date or time of a data value is called a(n):
   a. value stamp   
   b. time stamp    
   c. checkpoint    
   d. check counter

17. The property by which subtype entities possess the values of all attributes of a supertype is called:
   a. hierarchy reception    
   b. class management       
   c. attribute inheritance  
   d. generalization

18. Subtypes should be used when:
   a. there are attributes that apply to some, but not all instances of an entity type. 
   b. supertypes relate to objects outside the business. 
   c. the instances of a subtype do not participate in a relationship that is unique to that subtype. 
   d. None of the above

19. In the given figure, which of the following are subtypes of patient?
   a. outpatient       
   b. physician       
   c. bed             
   d. all of the above

20. The process of defining one or more subtypes of a supertype and forming relationships is called:
    a. specialization  
    b. generalization 
    c. creating discord 
    d. selecting classes
21. In the figure, a student:

![Diagram of student types]

a. must be a graduate student, an undergraduate, a special student or some other type of student.
b. must be a graduate student or an undergraduate student.
c. must be at least a special student.
d. none of the above

22. In the figure, the patient can be either an outpatient or a resident patient. This is an example of the _____ rule.

![Diagram of patient types]

a. disjoint
b. specialization
c. generalization
d. overlap

23. In the figure, the subtype discriminator is:
a. Part_Type  
b. Part_No  
c. Manufacture Part  
d. Location

24. A statement that expresses some aspect of the static structure of the organization is:  
a. a derivation  
b. an action assertion  
c. a structural assertion  
d. none of the above

25. In the figure, which is NOT a valid fact?

a. A course is a module of instruction in a particular subject area. 
b. Student name is an attribute of student.  
c. A student may register for many sections and a section may be registered for by many students.  
d. A student is advised by a faculty member.

26. Which of the following is NOT an action that may be performed on data objects?  
a. Create  
b. Update
c. Delete
d. Truncate

27. The relational data model consists of which components?
a. Data structure
b. Data manipulation
c. Data integrity
d. All of the above

28. An attribute or attributes that uniquely identify each row in a relation is called a:
a. Column
b. Foreign key
c. Primary key
d. Duplicate key

29. An attribute in a relation of a database that serves as the primary key of another relation in the same database is called a:
a. Link attribute
b. Foreign key
c. Foreign attribute
d. Duplicate key

30. In the figure, the primary key for “Order Line” relation is which type of key field?

```
CUSTOMER
+----------------+-----------+----------+---+---+
| Customer_ID    | Customer_Name | Address  | City | State | Zip |
+----------------+-----------+----------+---+---+

ORDER
+----------+---------------+-----------+
| Order_ID | Order_Date    | Customer_ID|
+----------+---------------+-----------+

PRODUCT
+-----------+----------------+-----------+
| Product_ID| Product_Description| Product_FINISH| Standard_Price | On_Hand |
+-----------+----------------+-----------+
```

a. Composite
b. Candidate
c. Standard
d. Grouped

31. The entity integrity rule states that:
a. no primary key attribute can be null.
b. referential integrity must be maintained across all entities.
c. each entity must have a primary key.
d. a primary key must have only one attribute.

32. A rule that states that each foreign key value must match a primary key value in the other relation is called the:
a. referential integrity constraint.
b. key match rule.
c. entity key group rule.
d. foreign/primary match rule.

33. In the figure, what type of relationship do the relations depict?

a. strong entity/weak entity
b. multivalued
c. composite foreign key
d. one to many

34. In the figure, what type of relationship do the relations depict?

a. strong/weak entity
b. one-to-many
c. ternary
d. many-to-many

35. In the figure, what type of relationship do the relations depict?
a. one-to-one
b. unary
c. one-to-many
d. many-to-many
II. **EER Diagramming.** Create a EER diagram using the notations discussed.

An international school of technology has hired you to create a database application to assist them in scheduling classes. After several interviews with the president, you have come up with the following list of entities, attributes and initial business rules.

- Room is identified by Building_ID and Room_No and also has a Capacity. A room can be either a lab or a classroom. If it is a classroom, it has an additional attribute called Board_type.
- Media is identified by Mtypeid and has attributes of MediaType and Type_Desc. Here we are tracking type of media (such as a VCR, projector, etc.), not the individual piece of equipment. Tracking of equipment is outside of the scope of the project.
- Computer is identified by Ctypeid and has attribute ComputerType, TypeDesc, DiskCapacity, and ProcessorSpeed. Note: only the type of computer, not an individual computer is being tracked.
- Instructor has identified by Emp_ID and has attributes Name, Rank and Office_Phone.
- Timeslot has identifier TSIS and has attributes DayofWeek, StartTime and EndTime.
- Course has identifier CourseID and has attributes CourseDesc and Credits. Courses can have none, one or many prerequisites; a Course can be a prerequisite to one or more courses. Course also have one or more sections. A section is assigned only to one course.
- Section has identifier SectionID and attribute EnrollmentLimit.

After some further discussions, you have come up with some additional business rules to help you create the initial design:

- An instructor teaches none, one or many sections of a course in a given semester.
- An instructor specifies preferred timeslots.
- Scheduling data are kept for each semester, uniquely identified by semester and year.
- A room can be scheduled for one section or no section during one timeslot in a given semester of a given year. However, one room can participate in many schedules, one schedule or no schedule; one timeslot can participate in many schedules, one schedule or no schedule; one section can participate in many schedules, one schedule or no schedules.
- A room can have one type of media, several types of media or no media.
- Instructors are trained to use one, none or many types of media.
- A lab has one or more computer types. However, a classroom does not have any computers.
- A room cannot be both a classroom and a lab. There also are no other room types to be incorporated into the system.
III. Creating Relational Schema. Create a relational schema for the EER diagram in Part II.