1. A database schema is
   a. the state of the db
   b. a description of the db using a specific data model
   c. the collection of related data
   d. the content of the db

2. A data model is (one or more)
   a. a set of relations in the db
   b. a model of the data stored
   c. the collection of stored data
   d. a set of concepts used to describe a db
   e. a tool that can be used to describe a db

3. A language that you can use to define tables, schemas, attribute domains, and constraints is called a
   a. storage definition language
   b. view definition language
   c. data definition language
   d. schema definition language
   e. database definition language

4. A database manipulation language is a language that allows
   a. modification of the external schema
   b. the content of the db to be accessed
   c. specification of updates and retrievals
   d. modification of the internal schema
   e. the db structure to be modified
   f. modification of the conceptual schema

5. Who or what is responsible for maintaining db consistency?
   a. the dbms vendor
   b. db applications
   c. end users
   d. db designers
6. The ER model is a conceptual data model
   a. true
   b. false

7. An entity type can have more than one key attribute
   a. true
   b. false

8. A weak entity type does not have any unique attributes
   a. true
   b. false

9. A key attribute can have NULL as its value
   a. true
   b. false

10. Attribute names are unique within a db
    a. true
    b. false

11. A derived attribute is (one or more)
    a. an attribute whose values are optional
    b. an attribute whose values can be computed
    c. an attribute that does not have a value for each entity
    d. an attribute whose values can be derived from other attributes/relationships

12. When mapping an ER schema into a relational schema, in what situation is a new relation NOT added to the db
    a. for each M:N relationship type
    b. for each higher degree relationship
    c. for each 1:1 or 1:N binary relationship type
    d. for each weak or regular entity type
    e. for each multivalued attribute

13. The relational data model is an example of
a. physical data models
b. implementation data models
c. conceptual data models

14. A prime attribute is an attribute of
   a. the primary key
   b. a relation
   c. a foreign key
d. any candidate key
e. a secondary key

15. A candidate key is (one or more)
   a. a set of attributes referring to another relation in the db
   b. an attribute with a unique value for each tuple of a relation
c. an attribute or a set of attributes that determines the values of all other attributes in the relation
d. a minimal superkey
e. an attribute that is potentially the key of a relation

16. The order of the attributes within a relation is not important
   a. true
   b. false

17. A relation R is defined as R(A, B, C, D, E, F), candidate keys are A and BC. Which of the following combinations of attributes are superkeys? (one or more)
   a. ACF
   b. ABC
c. BCD
d. BDF
e. CEF
   f. ABCDEF

18. The order of tuples within a relation is important
   a. true
   b. false

19. A superkey is
   a. the primary key plus the secondary key
   b. the set of attributes that has a unique value for each tuple in the relation
c. the set of all attributes belonging to any candidate key
d. a minimal set of attributes that has a unique value for each tuple of the relation

20. SQL is a procedural language
   a. true
   b. false

21. Which of the following data types would be suitable for an attribute that stores students’ user codes, given that we know they consist of three letters followed by two or three digits?
   a. MEMO
   b. NUMBER(3,3)
   c. CHAR(6)
   d. INTEGER
   e. VARCHAR(6)
   f. CLOB

22. A relational algebra expression equivalent to SELECT * FROM R, S is
   a. pi-all_attributes_from_R_and_S(R x S)
   b. an equi-join operation
   c. R x S
   d. an outer join
   e. pi-all_attributes_from_R_and_S(R * S)
   f. R * S

23. The primary key of a relation determines the value of all other attributes
   a. true
   b. false

24. A candidate key is defined to be an attribute or a set of attributes such that (one or more)
   a. it is a superkey
   b. it is a minimal set of attributes
   c. it determines the values of all other attributes
   d. it is a minimal set of attributes that determine all other attributes in the table
   e. its closure contains all attributes of the table

25. A table is in 3NF if (one or more)
a. there is more than one key  
b. there are no transitive FDs  
c. there are no partial FDs  
d. each FD either has a superkey on its left-hand side, or has a prime attribute on the right-hand side  
e. each FD has a superkey on its left-hand side  
f. there is only one key

26. A table is in BCNF if  
a. every FD has a superkey on its left-hand side  
b. there is a FD whose left-hand side is not a superkey  
c. the table is in 2NF  
d. the table is in 3NF  
e. there are no transitive FDs  
f. the table has only one key

27. A FD violates BCNF if id does not have  
a. a prime attribute on its right-hand side  
b. a key on its right-hand side  
c. a candidate key on its right-hand side  
d. a prime attribute on its left-hand side  
e. a superkey on its right-hand side  
f. a superkey on its left-hand side

28. Under what condition(s) is a relation always in 2NF? (one or more)  
a. if there are transitive dependencies  
b. if there is only one key  
c. when all FDs are partial  
d. if every candidate key is a single-attribute key  
e. if there is only on, single attribute key

29. A relation can be in 3NF without being in 2NF  
a. true  
b. false

30. Relational algebra is an example of (one or more)  
a. storage definition language  
b. view definition language  
c. data manipulation language
d. query language

e. data definition language

31. If it is necessary to retrieve the value of an attribute for all tuples in a relation, what operation should be used?
   a. natural join
   b. equijoin
   c. join
   d. grouping
   e. project
   f. select

32. The union operation is commutative
   a. true
   b. false

33. The operation that combines information from two relations using a specific condition is
   a. grouping
   b. join
   c. modify
   d. Cartesian product
   e. project
   f. select
Copy your answer to the answer sheet