

KATHMANDU UNIVERSITY
End Semester Examination
February/March, 2019

Marks scored:

Level : B.E.

Year : III

Course : GEOM 318

Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:


Date FEB 27 2019

SECTION "A"

[20 Q. × 0.5 = 10 marks]

Choose the best alternative from the given choices.

1. A database which supports a relatively small number of users within an organization is termed as:
a) Centralized database
b) Distributed database
c) Workgroup database
d) Enterprise database
2. In an ER-diagram, "double rectangles" represent:
a) Relationship Sets
b) Weak Entity Sets
c) Derived attributes
d) Multi-valued attributes
3. Updating the value of the view _____.
a) affects the relation from which it is defined
b) changes the view definition
c) does not affect the relation from which it is defined
d) does not change the view definition
4. Tables in 2NF _____.
a) eliminate all hidden dependencies
b) eliminate the possibility of insertion anomalies
c) have a composite key
d) have all non-key fields depend on the whole primary key
5. Which of the following is not the component of Data Dictionary?
a) Entity name b) Field name c) Data format d) Field size
6. An attribute in a relation is a foreign key if the key from one relation is used as an attribute in that relation.
a) Candidate b) Primary c) Super d) Sub
7. Desk clerks, in any organization, are categorized under which form of interaction with DBMS?
a) Casual end-user b) Naïve end-user
c) Sophisticated end-user d) Database Administrator
8. Which of the following is the syntax for views where V is view name?
a) Create view V as "query name"; b) Create "query name" as view V;
c) Create view V as "query expression"; d) Create "query expression" as view V;

9. We can test for the non-existence of tuples in a subquery by using _____ construct.
 a) Not exist b) Not exists c) Exist d) Exists
10. In SQL, the statement "Select * from R, S" is equivalent to:
 a) Select * from R natural join S b) Select * from R cross join S
 c) Select * from R outer join S d) Select * from R inner join S
11. Space-based model can also be termed as _____.
 a) Object-based model b) Field-based model
 c) Feature-based model d) Entity-based model
12. What will be the dimensional value if the boundaries of two polygons undergoes dimensionally extended- 9 Intersection Model?
 a) 0 b) 1 c) 2 d) 3
13. For select operation, _____ appear in the subscript and _____ argument appears in the parenthesis after the sigma.
 a) Relation, operation b) Relation, predicates
 c) Predicates, relation d) Operation, predicates
14. How do we represent node in Topological model?
 a) [arc, <point>] b) [point, <arc>]
 c) [arc, <node-start, node-end>] d) [point, <node-start, node-end>]
15. Aggregate functions can be used in the select list or the clause of a select statement or subquery. They cannot be used in a clause.
 a) Where, having b) Having, where c) Group by, having d) Group by, where
16. Which of the following does not fall under spatial geometry data types?
 a) STCrosses b) STIntersect c) STDifference d) TSymDifference
17. falls under both the logical and physical models.
 a) Entity names b) Foreign keys
 c) Entity relationships d) Table names
18. In Unified Modeling Language (UML), component diagram is a part of _____.
 a) Behavior diagram b) Activity diagram
 c) Structure diagram d) Object diagram
19. In spatial extension of ER diagram,  sign denotes
 a) Part_of (partition) b) Multi line
 c) Polygon d) Part_of (network)
20. Which one of the spatial geometry data types returns a geometric object?
 a) STContains b) STDisjoint c) STDistance d) STRelate

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SECTION "B"

[6 Q. × 4 = 24 marks]

Attempt *ANY SIX* questions:

1. Illustrate the term database and dataset. Explicate on how DBMS managed to overcome the disadvantages of existing systems. [1+3]
2. What are the issues that might be encountered while designing database? Explain how you would resolve them. [4]
3. Write short notes on: [2+2]
 - a) SQL Operators
 - b) Relational Integrity Constraints
4. Consider the relation Treatment with the schema Treatment (doctorID, doctorName, patientID, diagnosis) and functional dependencies:
doctorID → doctorName and
(doctorID, patientID) → diagnosis
Describe different types of anomaly that can arise for this table with example records. [4]
5. Define Spatial Database Management System. How is GIS different from SDBMS? [1+3]
6. Write executable query to create Database → KU, Schema → Geomatics, Table → InternalExam where the fields are: (StudentID, FirstName, LastName, Subject, Marks)
Provide appropriate data types while creating table. Also, insert at least four set of tuples into the table using SQL. [4]
7. What are the objectives of Database design? Explain how the use of Unified Modeling Language (UML) facilitates the entire design process. [2+2]

SECTION "C"

[2 Q. × 8 = 16 marks]

Attempt *ANY TWO* questions:

8. What is Normalization? Discuss the differences between Instance and Schema.
Consider the table STATIONERY having fields (Item, Color, Price, Tax) as below:

Item	Color	Price	Tax
Notebook	Blue, white	50.00	5.00
Pencil	Black, blue	10.00	1.00
Notebook	Blue, white	50.00	5.00
Eraser	Red, yellow	10.00	1.00

Check whether the table is in Normal Form. If not, convert into 3NF, showing sufficient tables in order to illustrate the concept of Normalization. [1+3+4]

9. a) Some Environmental agencies are assessing the impact of changing land-use patterns on climate change. Discuss how spatial data mining would be useful for them. [2]

b) Explain various modes of representation in geographic space modelling. What are the major drawbacks of Spaghetti model? Explain how Network and Topological models overcome these drawbacks. [3+3]

10. Consider the following relation:

Table1: Districts {ID (int), Name (varchar (80)), Shape (Polygon, 5672)}

Table2: River {ID (int), Name (varchar (80)), Shape (Linestring, 5672)}

Write SQL statements to answer the following queries: [4×2=8]

a) List the districts, with only one neighboring district.

b) List all districts, ordered by number of neighboring districts.

c) For all the rivers listed in the River table, find the districts through which they pass.

d) For each river, identify the closest district.