

UPES SAP ID No.:



**UNIVERSITY OF PETROLEUM AND ENERGY
STUDIES**

Examination, July 2020

Programme: B.Tech GIE

Semester : VI

Course Name: Spatial Database System

Max. Marks : 100

Course Code: PEGI 3003

Attempt Duration :

3Hrs. No. of page/s: 10

Note:

1. Read the instruction carefully before attempting.
2. This question paper has two section, Section A and Section B.
3. There are total of seven questions in this question paper. **One** in **Section A** and **six** in **Section B**
4. **Section A** consist of multiple choice based questions and has the total weightage of 60%.
5. **Section A** will be conducted online on BB Collaborate platform
6. **Section B** consist of long answer based questions and has the total weightage of 40%.
7. The maximum time allocated to **Section A** is two Hrs.
8. **Section B** to be submitted within 24 hrs from the scheduled time (*exceptional provision due extraordinary circumstance due to COVID-19 and due to internet connectivity issues in the far-flung areas*).
9. No submission of **Section B** shall be entertained after 24 Hrs.
10. **Section B** should be attempted after **Section A**
11. **The section B** should be attempted in blank white sheets (hand written) with all the details like programme, semester, course name, course code, name of the student, Sapid at the top (as in the format) and signature at the bottom (right hand side bottom corner)
12. Both section A & B should have questions from entire syllabus.
13. The COs mapping, internal choices within a section is same as earlier

SECTION A [60 MARKS]

Each question carry 1 mark

1. Which type can store a collection of objects of any type?
 - a) **GEOMETRYCOLLECTION**
 - b) MULTIPOINT
 - c) MULTILINESTRING
 - d) MULTIPOLYGON
2. Using indexes optimizes query performance.
 - a) **True**
 - b) False
3. Spatial Database system support
 - a) Spatial join
 - b) Modelling
 - c) Spatial Indexing
 - d) **All are true**
4. Spatial Database System and database management system offers same functionality
 - a) True
 - b) **False**
5. Which is not a basic spatial data type?
 - a) Line
 - b) Point
 - c) **Networks**
 - d) Polygon
6. Spatial database system can be best implemented in
 - a) ArcGIS Map
 - b) ArcGIS spatial analyst
 - c) ArcGIS spatial Network
 - d) **ArcGIS Database Engine**
7. Which one is not an example of spatially related collections of objects
 - a) Partitions
 - b) **Region**
 - c) Thematic map
 - d) Networks
8. By 'Spatial Data' we mean data that has
 - a) Complex values
 - b) **Positional values**
 - c) Graphic values
 - d) Decimal values

9. Which of the following belong to the eight spatial relationships?

Disjoint, meets, equals

Inside, covered by

Contains, covers, overlaps

All of the above

10. Spatial databases' are also known as

a) **Geodatabases**

a. Monodatabases

c) Concurrent databases

b. None of the above

11. Objects can be classified based on location, shape, size & orientation

a) **True**

b) False

12. DBMS stands for

a. Database Management System

b. Database Monitoring System

c. Database Manufacturing System

d. Database Mixing Station

13. Topological relationship means that different spatial objects will have diffractometers provide information about the compounds present in a solid sample as

a) adjacent

b) inside

c) disjoint

d) **all are correct**

14. Which is the category of Spatial Database system on the classification criteria of data models

a) Desktop system

b) Spatial information system

c) **Object oriented system**

d) Transaction system

15. Which is the category of Spatial Database system on the classification criteria of primary database function

a) Distributed system

b) Spatial information system

- c) Relational Information system
 - d) **Decision support system**
16. Spatial data used for internal use is categorized as
- a) **Stewardship**
 - b) Public share
 - c) Commodification
 - d) Copyrights
17. Integrity rule and stored procedure are integral component of
- a) Operating system
 - b) User interface system
 - c) **Database system**
 - d) Third party system
18. In spatial database system, database system will comprise only data
- a) True
 - b) **False**
19. A typical file based data processing system, will have input data, data processing software and output result
- a) **True**
 - b) False
20. The present database systems comprise
- a. Complex hardware and software systems
 - b. raster images
 - c. multimedia files
 - d. All of these
21. Actual database resides in
- a) conceptual model
 - b) logical model
 - c) **physical model**
 - d) none of these
22. DVD storage of database will come under
- a) primary storage
 - b) secondary storage
 - c) **Tertiary storage**
 - d) Buffer storage
23. Which of the following applied on data warehouse?
- a) write only

- b) **read only**
- c) both a & b
- d) none of these

24. Data mining is?

- a) time variant non-volatile collection of data
- b) **The actual discovery phase of a knowledge**
- c) The stage of selecting the right data
- d) None of these

25. Which one is not a data mining functionality?

- A) Clustering and Analysis
- B) **Selection and interpretation**
- C) Classification and regression
- D) Characterization and Discrimination

26. Which one is the output of knowledge discovery of database (KDD)?

- a) Query
- b) **Useful Information**
- c) Data
- d) information

27. An essential process used for applying intelligent methods to extract the data patterns is named as ...

- a) **data mining**
- b) data analysis
- c) data implementation
- d) data computation

28. In spatial database system, database is
- a) Designed with integrity rule
 - b) It has stored procedures
 - c) accessed by user through database engine
 - d) All are true
29. In database manipulation, the role of buffer manager is
- a) **to handle main memory**
 - b) to handle secondary memory
 - c) keep track of location data file
 - d) to locate secondary storage
30. Discretionary security in spatial database indicate
- a) classifies users and data into different security levels
 - b) **controls the ability of users to access specific data files**
 - c) allow users within a particular security level to access the data
 - d) All are true
31. This operator is used to query the columns of a table
- a) JOIN
 - b) **PROJECT**
 - c) SELECT
 - d) PRODUCT
32. This operator generates a new table by appending rows from one table with those of another table
- a) PRODUCT
 - b) INTERSECT
 - c) **UNION**
 - d) DIFFERENCE
33. ISOLATION in database transaction means
- a) Corrupted data should be isolated for certain period of time
 - b) data should be process in sequential manner
 - c) Data can never be isolated
 - d) **results of simultaneous transactions to be independent of each other**
34. Transaction control mechanisms applied in database transaction is
- a) *Concurrent control*
 - b) *Logging the transactions*
 - c) *Transaction commitment*
 - d) All are correct
35. The standard database management procedure when disc crash occur in these cases is to use we use the backup and recovery manager
- a) **True**
 - b) False

36. When database system allow taking backup while the process is in operation is known as cold backup
- a) True
 - b) **False**
37. SQL statements can be *Embedded in a high-level computer language*
- a) **True**
 - b) False
38. A distributed database architecture, as
- a) geographical distribution of computers located at different places
 - b) physical and logical distribution of database operations
 - c) Different servers may be connected through LAN/WAN
 - d) All are correct
39. Distributed database systems will always be having three-tier architecture
- a) True
 - b) **False**
40. Centralised database systems will always be having two-tier architecture
- a) **True**
 - b) False
41. In three-tier case the application server is more powerful than the client(s),
- a) **True**
 - b) False
42. The logical data structure is a conceptual configuration of how data are organised in a database for optimal performance and ease of administration.
- a) **True**
 - b) False
43. A Web server, which is equipped with a program called a Web-to-database middleware
- a) **True**
 - b) False
44. Which one is the output of knowledge discovery of database (KDD)?
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45. An essential process used for applying intelligent methods to extract the data patterns is named as ...

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 - d) data computation
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 - d) DIFFERENCEE
55. In a k-d tree, k originally meant?
- a) **number of dimensions**
 - b) size of tree
 - c) length of node
 - d) weight of node
56. Reducing search space by eliminating irrelevant trees is known as?
- a) pruning
 - b) partial results
 - c) freeing space
 - d) traversing
57. The 2d search tree has the simple property that branching on odd levels is done with respect to the first key.
- a) **True**
 - b) False
58. Insertion into a 2-d tree is a trivial extension of insertion into a binary search tree.
- a) **true**
 - b) false
59. Spatial Indexing of elevation points can be done using
- a) **B tree**

- b) B+ tree
- c) KD tree
- d) R tree

60. Spatial Indexing of landuse polygon can be done using

- a) B tree
- b) B+ tree
- c) KD tree
- d) R+ tree

SECTION B [40 MARKS]

Answer all questions. Each question carry 10 marks.

1. Evaluate R and R+ data structure with suitable implementation algorithms and example
2. Explain B tree structure with example.
3. What is the advantage of B+ tree structure over B tree data structure? Construct a B+ structure of order 5 for all the odd numbers between 10 to 50. Modify this structure by adding 7, 8 and then deleting 39.
4. Evaluate the role of Spatial Database System in Geoinformtics Engineering