

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), **Nov. - 2017**

B. Tech/ M. Tech (as applicable) in Computer Science & Engineering, Semester IX

Roll No.....

COURSE CODE: MTCS429

Time: 3 hours

Max. Marks: 100

COURSE TITLE: Spatial Database

Instructions to students:

1. Do not write anything other than your roll number on question paper.
 2. Assume suitable data wherever required and mention it clearly.
 3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
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Q.1A Objective type multiple choice questions (10 questions @ 1 mark)

10

- i. Which of the following are considered key elements of a paper map?
 - (a) Scale bar or ratio
 - (b) Annotation
 - (c) Map features(points, lines, area, surface)
 - (d) Projection information
- ii. How is a large city most likely to be represented on a 1:25,000 scale map?
 - (a) As a collection of points, lines and areas
 - (b) As a collection of points
 - (c) As an area
 - (d) As a line
- iii. Which of the following is not a type of map projection?
 - a) Conic
 - b) Geographical
 - c) Cylindrical
 - d) Azimuthal
- iv. The vector data model is based on which of the following?:
 - (a) Collections of points joint by straight lines.
 - (b) Cartesian Coordinate System
 - (c) Pixel or grid cells
 - (d) Tessellations
- v. Which of the following might be considered as the fourth dimension in GIS ?
 - (a) Time
 - (b) Scale
 - (c) Location
 - (d) Space
- vi. What is spatial interpolation?
 - (a) The process of establishing values for areas outside the boundary of an existing set of data points.
 - (b) The process of establishing a statistical relationship between two spatially correlated variables.

- (c) The process of modelling spatial pattern from a set of one or more data layers
- (d) The process of establishing values for areas between an existing set of discrete observations.
- vii. GIS deals with which kind of data.
 - (a) Numeric Data
 - (b) Binary Data
 - (c) Spatial Data
 - (d) Complex Data
- Viii By '*spatial data*' we mean data that has
 - a) Complex values
 - b) Positional values
 - c) Graphic Values
 - d) Decimal values
- ix. 'Spatial databases' are also known as :
 - (a) Geodatabases
 - (b) Mono databases
 - (c) Concurrent databases
 - (d) None of the above
- x. A 'data model' is a language that allows the definition of
 - a) The 'structures' that will be used to store the base data
 - b) The 'integrity constraints' that the stored data has to obey at all moments in time
 - c) The 'computer programs' used to manipulate the data
 - d) All of the above

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| Q.2 | Short answer type questions (4 questions @ 2.5 marks) | 10 |
| a) | Differentiate between raster and vaster data types. | |
| b) | Differentiate between Classification & Clustering. | |
| c) | Define Spatial Database. | |
| d) | Give examples of Open-source spatial database. | |
| Q.3A | How Entity relationship model is extended to represent spatial concepts?
What basic shapes are used in making pictogram? | 05 |
| Q.3B | Consider a case of highway between cities and conceptually model it using SPATIAL Modelling approach. State your assumptions. | 05 |
| Q.4A | Which type of spatial queries: Range query, Nearest Neighbor Query, Spatial Join Query is more efficient and why ? | 05 |
| Q.4B | Discuss the process of retrieving geographic data from spatial databases. Which tools and techniques are commercially available in the market for the same? | 05 |
| Q.5A | Geographic Information System(GIS) uses some specific data types. With the help of suitable example justify the specific data types. | 05 |

Q.5B Discuss the techniques for Association Mining. How Apriori algorithm is used to generate rules for Association Mining? 05

Q.6A Spatial Mining output depends on the pattern. Discuss the unique properties of Spatial Patterns with specified example. 05

Q.6B How clustering and auto-correlation approach is associated with each other in Spatial Mining? 05

OR

Q.6B Differentiate between raster data and Raster Spatio-temporal Data. Which type of data is preferable in Geographic Information System(GIS)? 05

Q.7A A raster image is rows and columns of cells, called of pixels, organized in a rectangular grid. Discuss various approaches used to store raster data. 05

Q.7B Develop Spatial indices that support both location based("what is at X") and feature -based queries("where is Y"). 05

OR

Q.7B Discuss the challenges of spatial database as compared to traditional database. 05

Q.8A Spatial database may contain traditional data with non-traditional data. What strategy do we use in answering a query that mixes traditional data with nontraditional data? Explain using suitable example. 15

Q.9 Spatial patterns may be discovered using techniques like classification, associations, clustering and outlier detection. Discuss any one method of each classification, clustering, association and outlier detection. 15