**Q1**

**(a)** Identify and discuss the three key issues involved in Distributed DB design.

**(6 Marks)**

**(b)** Discuss each of the following methods of retrieval :

1. Attribute-based retrieval (ABR).
2. Text-based retrieval (TBR).
3. Content-based retrieval (CBR).

Supplement your answer with details regarding the metadata class that each method of retrieval is appropriate to.

**(7 Marks)**

**(c)** Outline **four** architectures for MMDBMSs, namely.

* + 1. Loose/Tight Coupling
    2. Schema
    3. Functional
    4. System
    5. Distribution
    6. Interoperability.

**(8 Marks)**

**(d)** Examine each of the following in relation to multimedia storage management:

* + 1. Access methods
    2. Indexing
    3. Single disk storage
    4. Multiple disk storage
    5. Disk striping.

**(10 Marks)**

**(e)** Discuss the following techniques for MM Data Mining:

* + 1. Statistical Reasoning
    2. Machine Learning
    3. Visualization
    4. Parallel Processing
    5. Decision Support.

**(10 Marks)**

**Question 1 continues overleaf**

**Question 1 continued**

**(f)** Differentiate between three of the following methods of querying character data using SQL:

1. Exact Matching
2. Inexact Matching
3. The LIKE Operator
4. Proximity Searches
5. Missing Values
6. The IS NULL Operator.

**(9 Marks)**

**(Total 50 Marks)**

**Q2.**

**(a)** Compare and contrast 2PC and 3PC under the following headings:

1. The operation of each
2. Termination protocols implemented by each
3. Recovery protocols implemented by each.

**(12 Marks)**

**(b)** Identify the different types of metadata applicable to:

1. Text
2. Image
3. Video
4. Audio.

**(8 Marks)**

**(c)** Differentiate between the 3 architectures for content organization and

outline the advantages and disadvantages associated with each architecture.

**(6 Marks)**

**(d)** Discuss the following in relation to querying multimedia data:

1. Levels of complexity of what information can be retrieved.
2. Retrieval methods suitable for each level.
3. Semantic gap and simple queries.

**(9 Marks)**

**(e)** Differentiate between the retrieval and mining of the following MM data types:

1. Text
2. Image
3. Video
4. Audio.

Outline a taxonomy for text, image, video and audio mining.

**(7 Marks)**

**Question 2 continues overleaf**

**Q.2 continued**

**(f)** Discuss the measures utilised and the use of **four** of the following methods of image retrieval:

1. based on colour;
2. based on texture;
3. based on shape;
4. based on position;
5. based on image transformations; and
6. based on appearance.

**(8 Marks)**

**(Total 50 Marks)**

**Q3.**

1. Write a brief note on the following OO concepts :
2. Abstraction and encapsulation.
3. Objects and attributes.
4. Object Identity (OID).
5. Methods and messages.
6. Classes, subclasses, and superclasses.
7. Inheritance.

**(9 Marks)**

1. Discuss the 4 disparate aspects pertaining to metadata :
2. Metadata for combination of data types.
3. Ontologies.
4. Annotations.
5. Pedigree.

**(8 Marks)**

1. Differentiate between the following models:
2. Object Oriented Model
3. Object Relational Model
4. Hypersemantic Model

**(9 Marks)**

1. In relation to Distributed Multimedia Database Systems:
2. Identify the components of the DMP and discuss the role of each component of a DMP.
3. Detail the steps involved in designing a multimedia distributed db.

**(7 Marks)**

**(e)** Discuss the three-dimensional view of data mining technologies.

Supplement your answer with an illustration.

**(9 Marks)**

**(f)** Outline the role of disk scheduling and data striping in relation to the storage of video objects.

**(8 Marks)**

**(Total 50 Marks)**