**BSc (Hons) in MM Applications Development Module : Multimedia Databases**

**Semester II Exam May 2018 Solution & Marking Scheme**

**Q1.** **(a)** Students should identify and discuss the three key issues

involved in Distributed DB design.

*(3 \* 2 marks)*

**(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.

*(3 \* 2 marks, 1 mark for illustration)*

**(7 Marks)**

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

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

*(4 \* 2 marks)*

**(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

*(5 \* 2 marks)*

**(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.

*(5 \* 2 marks)*

**(10 Marks)**

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

(i) Exact Matching

(ii) Inexact Matching

(iii) The LIKE Operator

(iv) Proximity Searches

(v) Missing Values

(vi) The IS NULL Operator

*(3 \* 3 marks)*

**(9 Marks)**

**(TOTAL 50 MARKS)**

**Q2.** **(a)** Compare and contrast 2PC & 3PC under the following headings :

* + 1. The operation of each
    2. Termination protocols implemented by each
    3. Recover protocols implemented by each.

*(3 \* 4 marks)*

**(12 Marks)**

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

i. Text

ii Image

iii Video

iv Audio

*(4 \* 2 marks)*

**(8 Marks)**

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

outline the advantages and disadvantages associated with each architecture.

*(3 \* 2 marks)*

**(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 & simple queries.

*(3 \* 3 marks)*

**(9 Marks)**

**(e)** Differentiate between the retrieval & 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.

*(4 \* 1.5 marks, 1 mark for taxonomy)*

**(7 Marks)**

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

(i) based on colour;

(ii) based on texture;

(iii) based on shape;

(iv) based on position;

(v) based on image transformations; and

(vi) based on appearance.

*(4 \* 2 marks)*

**(8 Marks)**

**(TOTAL 50 MARKS)**

**Q3.** **(a)** Write a brief note on the following OO concepts :

* + 1. Abstraction and encapsulation.
    2. Objects and attributes.
    3. Object Identity (OID).
    4. Methods and messages.
    5. Classes, subclasses, and superclasses.
    6. Inheritance.

*(6 \* 1.5 marks)*

**(8 Marks)**

**(b)** Discuss the 4 disparate aspects pertaining to metadata :

* + 1. Metadata for combination of data types.
    2. Ontologies.
    3. Annotations.
    4. Pedigree.

*(4 \* 2 marks)*

**(8 Marks)**

**(c)** Differentiate between the following models :

* 1. Object Oriented Model
  2. Object Relational Model
  3. Hypersemantic Model

*(3 \* 3 marks)*

**(9 Marks)**

**(d)** In relation to Distributed Multimedia Database Systems:

(i) Identify the components of the DMP and discuss the role of each component of a DMP.

(ii) Detail the steps involved in designing a multimedia distributed db.

*(2 \* 4.5 marks)*

**(9 Marks)**

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

Supplement your answer with an illustration.

*(3 \* 2 marks, 1 mark for illustration)*

**(7 Marks)**

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

**(8 Marks)**

**(TOTAL 50 MARKS)**