**BSc (Hons) in Creative Computing Module : Multimedia Databases**

**Semester II Exam May 2019 Solution & Marking Scheme**

**Q1.** **(a)** Compare and contrast the four schemes of distributed locking:

* + 1. Centralised Locking.
    2. Primary Copy 2PL.
    3. Distributed 2PL.
    4. Majority Locking.

*(4 \* 3 marks)*

**(12 Marks)**

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

* + 1. Metadata for combination of data types.
    2. XML for mm Data
    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
  4. Active & Passive Objects

*(4 \* 3 marks)*

**(12 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 \* 5 marks)*

**(10 Marks)**

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

Also, detail how data striping schemes are used to overcome the issues associated with the storage of video objects.

**(8 Marks)**

**(TOTAL 50 MARKS)**

**Q2.** **(a)** Discuss the features of the OODBMS Manifesto.

*(12 \* 0.5 marks)*

**(6 Marks)**

**(b)** Define what is meant by the term ontologies and complement your answer with an example of an ontology specific to a multimedia object.

**(4 Marks)**

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

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

*(6 \* 2 marks)*

**(12 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)** Differentiate between 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

*(6 \* 2 marks)*

**(12 Marks)**

**(TOTAL 50 MARKS)**

**Q3.** **(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 \* 3 marks)*

**(9 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. Supplement your answer with illustrations where appropriate.

*(3 \* 3 marks, 2 marks for illustrations)*

**(11 Marks)**

**(d)** Write a brief note on the following data manipulation functions relating to multimedia query processing:

1. Object Editing.
2. Browsing.
3. Filtering.
4. Transaction Management.
5. Update Processing.
6. Query Processing.

*(6 \* 2 marks)*

**(12 Marks)**

**(e)** Outline & discuss the following techniques utilised with Text DBs:

1. TR;
2. SDE;
3. QDE;
4. Precision; and
5. Recall.

*(5 \* 2 marks)*

**(10 Marks)**

**(TOTAL 50 MARKS)**