FINAL EXAMINATION
FIRST SEMESTER SESSION 2011/2012

COURSE CODE / NAME : STIV3033 / MULTIMEDIA DATABASE
DATE : 12 JANUARY 2012 (THURSDAY)
TIME : 8.30 – 11.00 PM (2 ½ HOURS)
VENUE : DMS

INSTRUCTIONS:

1. This question booklet contains THREE (3) sections with THIRTY (30) questions i.e., Section A (17 questions), Section B (10 questions) and Section C (3 questions) in SIXTEEN (16) printed pages, excluding the cover page.
2. Answer ALL questions in the question booklet.
3. You are NOT ALLOWED to remove the question booklet from the examination hall.

MATRIC NO: ____________________________ (in word) ____________________________ (in number)
IDENTIFICATION CARD NO: ____________________________
LECTURER: ____________________________
GROUP: [ ] TABLE NO: ____________________________

DO NOT OPEN THIS EXAMINATION PAPER UNTIL INSTRUCTED

CONFIDENTIAL
SECTION A: Answer ALL questions (20 MARKS)

For questions 1-5, please identify whether the statement is True (T) or False (F) in the boxes provided.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Users of a database system expect to be able to manipulate the data and obtaining useful output by deleting and adding operations only.</td>
<td>(5 marks)</td>
</tr>
<tr>
<td>2. Four major components of database systems are data, software, hardware and user.</td>
<td></td>
</tr>
<tr>
<td>3. Examples of entities are CustomerName, Address and myKadNo.</td>
<td></td>
</tr>
<tr>
<td>4. In Text-based systems, all properties and relationships are presented in a textual format to the user.</td>
<td></td>
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<tr>
<td>5. In multiple disks storage technique on multimedia server, all objects belonging to different media types are stored in the same disk.</td>
<td></td>
</tr>
</tbody>
</table>

For questions 6 – 17 please fill in the blanks.

6. Stripping methods of objects stored in multiple disks are Simple, ______________ and ______________.  

7. An Object Video Information Database (OVID) video object definition consists of:  
   ______________, ______________ and ______________.  

8. In the stages of Unified Modeling Language (UML) modeling, the use case model describes the requirements of the system from the ______________ of view.  

9. One of the purposes of metadata is to manage data refreshing and migration so that the format will be readable over time. What type of metadata purpose is this?  
   ______________
10. What is the name of the properties that best describe the meaning of it in the ACID test transaction reliability below? _______________________

"The effects of successfully committed transaction should be permanently recorded in the database and must not be lost because of subsequent failure"

1 mark

11. There is several type of synchronization in audio-video media. The following statement resembles which type of audio-video media synchronization?

__________________________

"This type of synchronization is consistent in each stream of each linked media, regardless of the volume of data in the streams."

1 mark

12. ______________________ provide a meaning for all conceptual modeling constructs within a domain.

1 mark

13. In Content Based Image Retrieval (CBIR) a ______________________ represents a specific property of the image such as its color by a set of numbers which can be acquired for a sample image and matched to others in the database.

Text/Audio

Diagram 1

1 mark

14. Based on Diagram 1 above, what type of image access dimension is perform to access the contents and media objects? ______________________

1 mark

15. Each object in the Class Hierarchy which responds to the same messages, use the same methods, and have variables of same name and type is called ______________________

1 mark
16. An example of _____________________________ is the derivation of facial features of a person's photographic image (such as the type of nose or ear, color of hair) and derivation of camera operations (such as panning, tilting and zooming) in a video clip.

(1 mark)

17. _____________________________: Describe the interpretations created from the Physical Storage representation of media objects.

(1 mark)
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SECTION B: Short Answer (40 MARKS)

Answer ALL questions

1. List TWO (2) database approaches that have been used for coping with media data size. (2 marks)

2. Give FIVE (5) objectives of compression. (5 marks)

3. Names FOUR (4) techniques that can be used in File Retrieval Structures. (4 marks)
4. Differentiate between content-dependent and content-independent that are used in metadata for query processing.  

(4 marks)

5. The following questions are related to Text-Based Retrieval (TBR)
   a. What is the meaning of Text-based Retrieval (TBR)?  
      (2 marks)
   b. Give an example of TBR.  
      (2 marks)
   c. What is the disadvantage of using the technique?  
      (1 mark)
6. Explain the meaning of actor and use case in UML modeling. (4 marks)

**ACTOR:**

**USE CASE:**

7. Draw a use case diagram to show the relationship between an actor and a use case in the cake ordering system. (2 marks)
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8. A peer-to-peer (P2P) architecture is a type of network in which each device has equivalent capabilities and responsibilities. Today, with the advent of pervasive computing technology, more devices are empowered with communication capabilities. When such devices are clustered, they form a P2P network.

   a. Using your smart phone, PDA, and PC form a P2P network to share your address book. Draw a diagram to show the P2P architecture. (2 marks)

   b. Explain the differences between P2P architecture and client/server architecture. (3 marks)
9. Apply the concept of Data model shown in Diagram 2 below and explain how each element (Database State, Schema, Data Manipulation) function in the Facebook Application.

(3 marks)
You were given the following "Orders" table:

<table>
<thead>
<tr>
<th>O_Id</th>
<th>OrderDate</th>
<th>OrderPrice</th>
<th>Customer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>11/11/2011</td>
<td>1000</td>
<td>Ahmad</td>
</tr>
<tr>
<td>2</td>
<td>23/10/2011</td>
<td>1600</td>
<td>Nelly</td>
</tr>
<tr>
<td>3</td>
<td>02/09/2011</td>
<td>700</td>
<td>Ahmad</td>
</tr>
<tr>
<td>4</td>
<td>03/09/2011</td>
<td>300</td>
<td>Ahmad</td>
</tr>
<tr>
<td>5</td>
<td>30/11/2011</td>
<td>2000</td>
<td>Jimmy</td>
</tr>
<tr>
<td>6</td>
<td>04/10/2011</td>
<td>100</td>
<td>Nelly</td>
</tr>
</tbody>
</table>

a. Write an SQL statement to find the average value of the "Orderprice" fields and place it in OrderAverage. (Note: Assume that OrderAverage already exist) and show the result.

(3 marks)

b. Based on the following SQL statement, show the result.

```
SELECT Customer FROM Orders
WHERE OrderPrice>({SELECT AVG(OrderPrice) FROM Orders})
```
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SECTION C: Long Answer (40 MARKS)

Answer ALL questions.

1. Read the paragraph below and answer the following questions.

Kak Kiah Kerepek Shop

The kerepek business was established in the early year of 2000 and has provided delicious and unforgettable flavours to customers since then. The objective of the company is to specialize in the buying and selling of the world’s delicious kerepek. As well as operating a number of retail shops selling kerepek and related products directly to its customers, the company offers a number of other services to its customers, both individual and corporate, including advice on selecting kerepek for laying down, corporate meeting, picnic and so forth. The company provides secure temperature-controlled rooms for customers to store their kerepek if they choose not to store it in their home. However, recently the company has faced problem dealing with missing kerepek in the store rooms. An undercover detective, under Forensic Unit from Sintok City Police Department wants to hire you to solve the problem by developing a low-cost multimedia systems application to identify finger prints that appears on the doors and windows of the store rooms. The company suspects that a number of employees are involved with the missing kerepek.

a. What technique can you use to solve this problem? (1 mark)

b. Explain how your technique is going to work in order to overcome the issues. (3 marks)
c. Draw a flowchart to support your explanation. (5 marks)
d. Design a multimedia database architecture that has all the **FIVE** (5) views to support your system.

(7 marks)
After the pre-processing of an image, objects in the image are recognized and their symbolic names are assigned. The identified objects are stored using their geometrical boundaries. Geometric boundary of objects can be stored using Minimum Bounding Rectangle (MBR) or by using a Sweep Line Representation.

Briefly explain how MBR and Sweep Line Representation work.

(4 marks)

**MBR Representation:**

**Sweep Line Representation:**
An article on the importance of Information Communication Technology (ICT) title "ICT and Today's World" was written by Prof. Dr. Ramli Hasan from Information Technology club at Universiti Utara Malaysia, Sintok Kedah. The article was circulated a recent symposium. Besides text, the article also highlights the statistical tables of IT literacy in Malaysia and a few photographs on the latest Technology.

Using the Document Type Definition (DTD) tree, describe the elements for the article.

(8 marks)
3 The following questions are related to Speech Recognition System.

a. A speech recognition system has two components which are Signal Processing Module and Pattern Matching Module. Draw a diagram to show the function of Speech Recognition System.

(5 marks)
b. Briefly explain how Signal Processing Module works. (4 marks)

c. List the THREE (3) popular algorithm that are used in Pattern Matching Algorithm. (3 marks)