



UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2013/2014**

COURSE NAME : MULTIMEDIA DATABASE
COURSE CODE : BIT 31903
PROGRAMME : 3 BIT
EXAMINATION DATE : JUNE 2014
DURATION : 3 HOURS
INSTRUCTION : ANSWER ALL QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1 Questions Q1(a) – Q1(d) are based on the following scenario.

Smart Streaming Technology Sdn. Bhd. has developed a song streaming application. A client can register at the www.songondemand.com website to use the song streaming service. A registered client browses the list of songs from the song catalog. A song may be streamed on demand or being scheduled to a predetermined time. The client can select the song based on the singer its category (e.g., pop, jazz, classic), the title of the song or the song's cover page. During streaming, the song can be paused and resumed play as requested.

- (a) Propose **THREE (3)** types of multimedia data used for developing the required database. For each type, provide **ONE (1)** possible file extension format.

image .jpg text .txt or .doc
 audio .mp3 video .mp4

(6 marks)

- (b) Propose **THREE (3)** requirements to be considered in developing the song streaming application.

= Client want to hear the song at any time and any where (6 marks) = communication network internet
 = Interactive web-based

- (c) Design the database schema for the application. Data dictionary can be discarded.

= Stripping-Storage technique

- (d) Propose the song table attributes based on your answer in Q1(c). (5 marks)

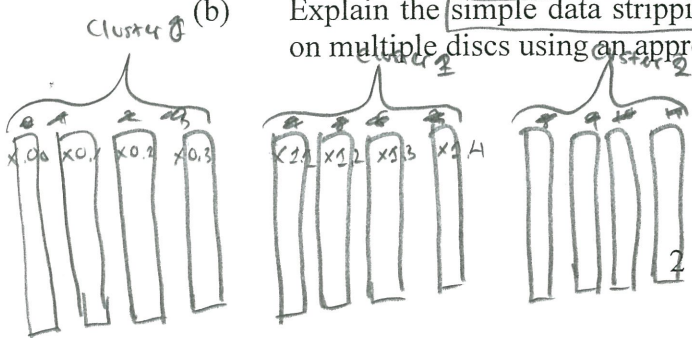
Q2 Questions Q2(a) and Q2(b) are based on the following scenario.

Disk stripping is a process to store multimedia objects in multiple disks. It has become popular due to the availability of RAID architecture.

- (a) Justify **ONE (1)** reason why disk stripping is important in relation to store and retrieve multimedia objects.

= improve the performance of retrieve and storage (3 marks)
 increase the storage capacity in the application system = have the independent data storage

- (b) Explain the simple data stripping technique for stripping multiple objects on multiple discs using an appropriate figure.



meta (7 marks)
 The data will storage and = Divide into own disk which it have a cluster block.

- (c) Assume the b_{disk} represents the maximum disk bandwidth and b_{object} is the maximum bandwidth required for an object. Calculate the maximum number of objects that can be retrieved concurrently from the disk, if b_{disk}

$$\frac{b_{\text{disk}}}{b_{\text{object}}} = \frac{300}{10}$$

= 300 and $b_{\text{object}} = 10$ (5 marks)

= disk bandwidth

- (d) Assume that there are five concurrent retrievals of 5 objects that are similar in nature (the size and consumption rates are the same). Consider the memory requirement of each object at a time instant T_1 : subobject O_1 requires $B/6$, O_2 requires $B/3$ memory, O_3 requires $B/3$ memory, O_4 requires B memory and O_5 requires $3B$ memory. Calculate total memory requirement for concurrent retrieval of these objects.

(5 marks)

- (e) A multimedia database server with a main memory of M needs to support N concurrent object retrievals. Assume $N = 400$, calculate the minimum number of M in Bytes (B) to support the concurrent object retrievals.

(5 marks)

$$NB/2 = M$$

$$400/2 = m$$

200 bytes

$$200 = m$$

Q3

- (a) Given the following scenario.

Your multimedia and graphic production company got a new job from one of your clients. The job requires you to develop one new logo for the client's company. For the copyright purpose, you need to determine whether the new logo you have commissioned might conflict with other logos that have already been copyrighted and being stored in the REGISTERED_LOGOS database. For that purpose, you need to use the REGISTERED_LOGOS database to make the comparison.

Write SQL/MM statements correspond to the given scenario using texture descriptions of the logo, where $SI_score > 1.2$.

(5 marks)

= SELECT * FROM ALL_LOGOS WHERE SI_FindTexture(newLogo).
SI_score(Logo) > 1.3

= SELECT * FROM REGISTERED_LOGOS WHERE SI_FindTexture(newLogo).
SI_score(logo) > 1.2

$$O_1 = \frac{B}{6} = \frac{B \times 1}{6 \times 1} + \frac{B \times 2}{3 \times 2} + \frac{B \times 2}{3 \times 2} + \frac{B \times 4}{1 \times 6} + \frac{3B \times 6}{1 \times 6}$$

$$O_2 = \frac{B}{3} = \frac{1B}{6} + \frac{2B}{6} + \frac{2B}{6} + \frac{6B}{6} + \frac{18B}{6}$$

$$O_3 = \frac{B}{3} = \frac{2B}{6} \#$$

$$O_4 = B$$

$$O_5 = 3B$$

(b) Given the following table definition.

```
CREATE TABLE PM.SI_MEDIA (
    PRODUCT_ID          NUMBER(4),
    PRODUCT_PHOTO       SI_StillImage,
    AVERAGE_COLOR       SI_AverageColor,
    CONSTRAINT id_pk    PRIMARY KEY (PRODUCT_ID));
```

Wavelet

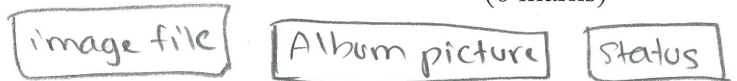
(i) Insert into PM.SI_MEDIA table an object with PRODUCT_ID = 3 and have average color of RED = 20, GREEN = 30 and BLUE = 40. (5 marks)

(ii) Derive SI_AverageColor object for image with PRODUCT_ID = 4 using the SI_FindAvgClr() function. (5 marks)

(c) Propose **TWO (2) methods** suitable for retrieving image from online repositories using content. (4 marks)

*= color = position
= texture = image transformation
= shape = appears*

(d) Create **THREE (3) possible metadata** when a person uploads an image from his smart phone into the Facebook application. (6 marks)

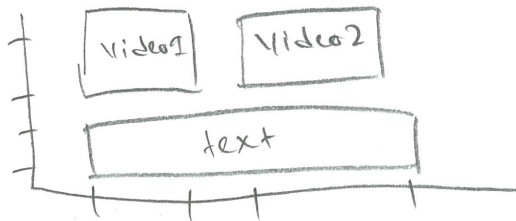


Q4 Questions Q4(a) and Q4(b) are based on the following query.

Give me all audios and videos of the football match between Johor DT versus Pahang sometime between the first 45 minutes where Pablo Aimar scored a goal assisted by Safiq Rahim.

(a) Justify the type of the temporal specification and discuss your answer. (5 marks)

(b) Develop the spatial model for the output, assuming that the query will display the output which consists of two windows for video and one window for text. Both video should be positioned at the top of the screen side by side with the same length and height while the text will be positioned exactly below both video. (8 marks)



(c) Given the following scenario.

A multimedia product consists of 9 objects. Object w is a text with the duration of t1 to t7. Objects x1, x2, x3 and x4 are images where x1 meets x2, and x3 meets x4. x1 starts at t1 while x3 starts at t4. x1 and x2 have the same duration of 1, while x3 and x4 have the same duration of 1.5. Objects y1 and y2 are video where y1 is before y2. y1 duration is t3-t1 while y2 duration is t7-t4. Objects z1 and z2 are video where z2 is after z1. z1 duration is t3-t1 while z2 duration is t7-t4.

Develop the timeline model, group by multimedia elements.

(8 marks)

(d) Suggest **TWO (2)** sub-components in a multimedia database (MMDBMS) server required in developing a social network application.

(4 marks)

- = Storage manager - store and retrieve.
 - = metadata manager - manage the information media - text audio graphic
 - = Data manager
 - = Query processing
 - = Index manager
 - = communication manager
 - = Communication manager
 - = Retrieval schedule generator
 - = Response Handler
 - = Interactive Query Formulator
- END OF QUESTION -

w = text → T1-T7

x1, x2, x3, x4 = image

x1 meet x2, x3 meet x4

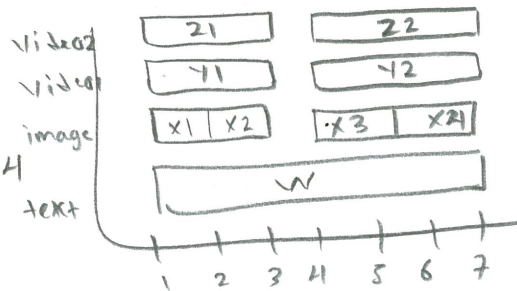
x1 start → T1-t3

x3 start → T4

x1, x2 = sama duration 1

x3, x4 = 1.5

y1, y2 video



divide
devi