Kafrelsheikh University
Faculty of E ngineering
Electrical Engineering Dept.
Subject: Advanced Database Systems
(Full Mark: 90 Marks)

Forth Year Students
(2007 modified)
Final Exam
Date: 4 /3 / 2021
Time Allowed : 3 hours

The course code: ECS4120	This course intend the following iLOS according to (NARS 2009): a (6, 8, 11, 16, 17, 18) - b (9, 12, 13) - c (2, 15, 17, 19) - d (2, 6, 7, 8)

Answer the following *three* question: (*In two Pages*)

Question 1 *(30 Marks)*

(a) What is meant by "*business rules*" in database? What is its importance in database? Mention types of business rules in database.

(b) From your study of the Star Schema, answer the following question:

  i. Construct an overall schema of full star schema model

  ii. Can a fact table have no *nonkey* attributes? Why or why not?

  iii. What is a helper table, and why is it often used to help organize derived data.

(c) *In Data warehousing*, normalizing dimension tables is important. Explain the methods to normalize the dimension tables. Give an example for each method.

(d) From your study to the importance of attaching a database to a Web page:

  i. Mention Web Application Components.

  ii. Internet-Related Languages used for creating WEB pages.

(e) The following table shows some simple student data as of the date 06/20/2010:

Key	Name	Major
001	Amy	Music
002	Tom	Business
003	Sue	Art
004	Joe	Math
005	Ann	Engineering

The following transactions occur on 06/21/2010:

  • Student 004 changes major from Math to Business.

  • Student 005 is deleted from the file.

  • New student 006 is added to the file: Name is Jim, Major is Phys Ed.

The following transactions occur on 06/22/2010:

  • Student 003 changes major from Art to History.

  • Student 006 changes major from Phys Ed to Basket Weaving.

  Your answer involves two parts:

  i. Construct tables for 06/21/2010 and 06/22/2010, reflecting these transactions; assume that the data are transient.

  ii. Construct tables for 06/21/2010 and 06/22/2010, reflecting these transactions; assume that the data are periodic.

Question 2   *(30 Marks)*

(a) "XML is becoming the standard for e-commerce data exchange over web". Based on that:

  i) Define web services,

  ii) Mention in details the Web Services protocol stack, *and*

  iii) Explain by drawing, Web services deployment

(b) i. What is the difference between Data Mining and Text mining?

  ii. Mention the Data mining techniques and applications.

(c) From your study to *database administration*, mention the five areas where threats to data security may occur.

(d) What is meant by Middleware and APIs?

(e) *"The type of restart used for database depends on the nature of its failure"*. Mention the techniques used in recovery and restart the database failure.

(f) *"Big Data and Analytics are two scientific fields concern data science."*

  i. Define each of them

  ii. Mention types of Analytics in details.

Question 3   *(30 Marks)*

(a) What is the importance of Data Quality? Mention the steps for improving poor data quality.

(b) By drawing, show the changes can be made in data administration at each stage of the traditional database development life cycle to deliver high performance database system.

(c) Locking Mechanisms is used when some error occurred. Mention briefly locking levels and Lock types.

(d) Today, *OLTP* and *Data Visualization* are two tools to represent Descriptive analytics in Data Science field. Explain this statement showing their meaning and types (if found).

(e) *MapReduce* is one of the steps of Big Data technology. Only by drawing, explain the stages of Schematic representation of MapReduce.

(f) Analytics encompasses more than Business Intelligence (BI).why?

With my best wishes

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