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

Forth Year Students
(2007 modified)
Final Exam
Date: 2 / 1 / 2019
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) In the Processing in 3-Tier Applications, two kinds of page requests are used. Mention these pages and explain how they operate with the database server in WWW. (***Hint:*** you can use drawing to explain your answer)

(b) 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.

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

(d) You are to construct a star schema for Simplified Automobile Insurance Company. The relevant dimensions, dimension attributes, and dimension sizes are as follows:

InsuredParty	Attributes: *InsuredPartyID* and *Name.* There is an average of two insured parties for each policy and covered item.
CoverageItem	Attributes: *CoverageKey* and *Description.* There is an average of 10 covered items per policy.
Policy	Attributes: *PolicyID* and *Type.* The company has approximately 1 million policies at the present time.
Claim	Attributes: *ClaimID, ClaimDescription, and ClaimType* The company experiences an average of 2000 claims per month
Period	Attributes: *DateKey* and *FiscalPeriod.*

Facts to be recorded for each combination of these dimensions are *PolicyPremium*, *Deductible*, and *MonthlyClaimTotal.*

i. Design a star schema for this problem.

ii. Estimate the number of rows in the fact table, using the assumptions stated previously.

iii. Estimate the total size of the fact table (in bytes), assuming that each field has an average of (5 bytes).

Question 2 *(30 Marks)*

(a) What is the relation between XML and Web Services? Mention the main component of the *Web Service Protocol Stack.*

(b) From your study to Data Quality,

i) Mention the steps for improving poor data quality.

ii) Why is master data management important in an organization?

(c) *In data integration*, reconciled data are referred to as the result of the ETL process. Mention the main steps of reconciled data. Explain briefly by drawing model for these steps.

(d) SOX audit involves three area of controls. Mention them with brief discussion.

(e) 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).

(f) *In database administration*, the type of restart used for database depends on the nature of its failure.

i) Mention the techniques used in recovery and restart the database failure.

ii) To prevent failure of database system, the administrator uses: *Deadlock* or *Data Availability* or *Versioning*. Explain showing the difference between them.

Question 3 *(30 Marks)*

(a) What is Big Data? Mention its 5V's characteristics.

(b) Give short nots about: *Hadoop*, *MapReduce*, *Hadoop Distributed File System (HDFS)*, and *Business Intelligence (BI)*

(c) i) What is meant by "Analytics"? Mention types of Analytics.
ii) Why is Analytics encompasses more than BI ?

(d) Mention the three key issues needed for designing Distributed Database. Explain briefly each of them.

(e) From you study to Distributed DBMS

i. Draw the Distributed DBMS Architecture (showing ***local*** transaction steps).

ii. Mention main Distributed DBMS Transparency Objectives.

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

With my best wishes

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