DATABASE MANAGEMENT SYSTEM AND COMPUTER NETWORKING (CSEN 3205)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

Candidates are required to give answer in their own words as far as practicable.

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) Relational algebra is a
(a) Procedural Language (b) Non-Procedural Language
(c) Query language (d) Structured language.

(ii) View is a
(a) Temporary table (b) Virtual table
(c) Permanent table (d) SQL statement.

(iii) ''End to end delivery'' is done by:
(a) Transport Layer (b) Network Layer
(c) Data Link Layer (d) Session Layer.

(iv) Redundancy is dangerous as it is potential threat to data
(a) Integrity (b) Consistency
(c) Sufficiency (d) None of these.

(v) In a two phase locking protocol a transaction must
(a) Release all locks at the same time
(b) Not obtain any new locks once it has started locks
(c) Only obtain locks on item not used by any other transactions.
(d) Ensure that deadlock will never occur.

(vi) The interconnection network is very much costly in
(a) MESH (b) STAR (c) BUS (d) RING.

(vii) An attribute of one table matching the primary key of another table is called
(a) Foreign Key (b) Super Key
(c) Composite Key (d) Secondary key.

(viii) The decoupling of external level and the conceptual level is called
(a) Logical data Independence (b) Local data Independence
(c) Physical data Independence (d) Non-Local data Independence.

(ix) Communication takes places in both direction but one at a time is called
(a) full duplex (b) half duplex
(c) Simplex (d) None of these

(x) Signaling and interpretation of bits are done in OSI:
(a) Data link layer (b) Physical layer
(c) Application layer (d) Presentation layer.

Group – B

2. (a) Describe three tier architecture of DBMS. Define Physical Data Independence and Logical Data Independence.

(b) Answer the following queries in SQL using the given database schema:
EMP(Emp_No,Ename,Eadd,Designation,Bdate,Mg_No,Salary,Dno);
DEPT(Dname,Dno,Mg_No);
PROJECT(Pno,Pname,Dno,Plocation);
WORKS_ON(Eno,Dno,Hours);
(i) List the employee no, names, address of all the employees working in 'Research' department.
(ii) For all projects in Kolkata print the project number, project location, controlling department's number and its manager's name and address.
(iii) List the average salary of all the employees working in 'Education' department.
(iv) List the employees whose salary is same as the salary of FRANK or SANDRINE. List the result in descending order of salary.

(2 + 2) + (2 × 4) = 12

3. (a) Design an E-R diagram of hospital management system with the following entity:Try to include the constraints in the E-R.
User (login, password), Admin (login, password),
Test (diag_no, diag_date, remark, advice_date, final _diag,ecg, others),
Patients (reg _ no, reg _ date, name, add, city, contact _ no),
Medicine (diag_no, med_no, med_name, precaution, no_of_doses),
Blood_test (reg _no, test_date, haemoglobin, tlc,esr, other),
Patient _ fee (receipt _ no, reg _ no, amt _ due, amt _ paid,date _ payment).

(b) Describe derived attributes, aggregation relationships with example.

8 + (2 + 2) = 12

Group – C

4. (a) Explain the terms 'partial functional dependency' and 'non-transitive dependency' with example.

(b) With suitable examples show how recovery in a database system can be done using LOG file with:
(i) Immediate updation
(ii) Deffered updation.

(c) What are the ACID properties of a transaction?

3 + 5 + 4 = 12

5. (a) Explain with example: Primary key, foreign key and candidate key.

(b) Consider the relation assignment {worker_id,building_id, startdate, name skilltype} and FDs are {worker_id->name, (worker_id, building_id)->startdate}. Is the relation in 2NF? If not, then make it in 2NF.

(c) Define BCNF. How does it differ from 3 NF? Why is it considered as stronger than 3 NF?

5 + 3 + 4 = 12

Group – D

6. (a) Define the four fundamental characteristics of an effective data communication system?

(b) Compare simplex, half duplex and full duplex communication.

(c) In perspective of computer network, what are the most important network criteria? Briefly explain them.

4 + 4 + (1 + 3) = 12

7. (a) Write down the advantages of mesh and star topology.

(b) What are the functions provided by physical link layer and network layer in the OSI model?

(c) Given an IP address 130.34.54.12. Find the class of the given IP address in classful addressing scheme. Also find the netmask of that class and determine the netid and host id.

(2 + 2) + (2 + 2) + (1 + 1 + 1 + 1) = 12

Group – E

8. (a) What are the advantages of distributed systems over the centralized systems?

(b) Briefly explain about the architecture of an email.

3 + 9 = 12

9. Write short notes on the following: (any three) **(3 × 4) = 12**
   (i) Packet switching and circuit switching
   (ii) URL
   (iii) Search Engine
   (iv) Different documents in WWW.

Department & Section	Submission Link
BT	https://classroom.google.com/c/OTMwOTkzMzI2Mzla/a/MzY5MTI1ODY0NTgy/details